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<110> Human Genome Sciences, Inc. et al.
 <120> Staphylococcus aureus genes and polypeptides
 <130> PB484
 <140> US 09/512,255
 <141> 2000-02-24
 <150> US 60/098,964
 <151> 1998-09-01
 <150> US 60/009,861
 <151> 1996-01-05
 <150> PCT/ US99/19726
 <151> 1999-08-31
 <150> US 08/956,171
 <151> 1997-10-20
 <160> 61
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Ile	Ser	Lys	Met	Thr	Gly	Ile	Lys	Glu	Arg	His	Trp	Ala	Asp	Asp	Asp	35	40	45	
Gln	Asp	Thr	Ser	Asp	Leu	Ala	Tyr	Glu	Ala	Ser	Leu	Lys	Ala	Ile	Ala	50	55	60	
Asp	Ala	Gly	Ile	Gln	Pro	Glu	Asp	Ile	Asp	Met	Ile	Ile	Val	Ala	Thr	65	70	75	80
Ala	Thr	Gly	Asp	Met	Pro	Phe	Pro	Thr	Val	Ala	Asn	Met	Leu	Gln	Glu	85	90	95	
Arg	Leu	Gly	Thr	Gly	Lys	Val	Ala	Ser	Met	Asp	Gln	Leu	Ala	Ala	Cys	100	105	110	
Ser	Gly	Phe	Met	Tyr	Ser	Met	Ile	Thr	Ala	Lys	Gln	Tyr	Val	Gln	Ser	115	120	125	
Gly	Asp	Tyr	His	Asn	Ile	Leu	Val	Val	Gly	Ala	Asp	Lys	Leu	Ser	Lys	130	135	140	
Ile	Thr	Asp	Leu	Thr	Asp	Arg	Ser	Thr	Ala	Val	Leu	Phe	Gly	Asp	Gly	145	150	155	160
Ala	Gly	Ala	Val	Ile	Ile	Gly	Glu	Val	Ser	Asp	Gly	Arg	Gly	Ile	Ile	165	170	175	
Ser	Tyr	Glu	Met	Gly	Ser	Asp	Gly	Thr	Gly	Gly	Lys	His	Leu	Tyr	Leu	180	185	190	

Asp Lys Asp Thr Gly Lys Leu Lys Met Asn Gly Arg Glu Val Phe Lys
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 Phe Ala Val Arg Ile Met Gly Asp Ala Ser Thr Arg Val Val Glu Lys
 210 215 220
 Ala Asn Leu Thr Ser Asp Asp Ile Asp Leu Phe Ile Pro His Gln Ala
 225 230 235 240
 Asn Ile Arg Ile Met Glu Ser Ala Arg Glu Arg Leu Gly Ile Ser Lys
 245 250 255
 Asp Lys Met Ser Val Ser Val Asn Lys Tyr Gly Asn Thr Ser Ala Ala
 260 265 270
 Ser Ile Pro Leu Ser Ile Asp Gln Glu Leu Lys Asn Gly Lys Ile Lys
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 atacacttat actaaaacag gtggtaaatgc cgacttttac attacccta ctaaaaatga 240
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 aacaaaagaa ttagagttag attatcgtaa tagcattatt caaaaagaac acttagttgt 660
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attccaaaga cgcctggtc attttgcagg taaattgata caagattcta atttgcaagg 840
tcaccgtatt ggcggcggtt aagtttcaac caaacacgct ggttttatgg taaatgtaga 900
caatggaact gctacagatt atgaaaacct tattcattat gtacaaaaga ccgtcaaaga 960
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Thr Gly Gly Asn Ala Asp Phe Tyr Ile Thr Pro Thr Lys Asn Glu Glu
35 40 45
Val Gln Ala Val Val Lys Tyr Ala Tyr Gln Asn Glu Ile Pro Val Thr
50 55 60
Tyr Leu Gly Asn Gly Ser Asn Ile Ile Ile Arg Glu Gly Gly Ile Arg
65 70 75 80
Gly Ile Val Ile Ser Leu Leu Ser Leu Asp His Ile Glu Val Ser Asp
85 90 95
Asp Ala Ile Ile Ala Gly Ser Gly Ala Ala Ile Ile Asp Val Ser Arg
100 105 110
Val Ala Arg Asp Tyr Ala Leu Thr Gly Leu Glu Phe Ala Cys Gly Ile
115 120 125
Pro Gly Ser Ile Gly Gly Ala Val Tyr Met Asn Ala Gly Ala Tyr Gly
130 135 140
Gly Glu Val Lys Asp Cys Ile Asp Tyr Ala Leu Cys Val Asn Glu Gln
145 150 155 160
Gly Ser Leu Ile Lys Leu Thr Thr Lys Glu Leu Glu Leu Asp Tyr Arg
165 170 175
Asn Ser Ile Ile Gln Lys Glu His Leu Val Val Leu Glu Ala Ala Phe
180 185 190
Thr Leu Ala Pro Gly Lys Met Thr Glu Ile Gln Ala Lys Met Asp Asp
195 200 205

Leu Thr Glu Arg Arg Glu Ser Lys Gln Pro Leu Glu Tyr Pro Ser Cys
 210 215 220
 Gly Ser Val Phe Gln Arg Pro Pro Gly His Phe Ala Gly Lys Leu Ile
 225 230 235 240
 Gln Asp Ser Asn Leu Gln Gly His Arg Ile Gly Gly Val Glu Val Ser
 245 250 255
 Thr Lys His Ala Gly Phe Met Val Asn Val Asp Asn Gly Thr Ala Thr
 260 265 270
 Asp Tyr Glu Asn Leu Ile His Tyr Val Gln Lys Thr Val Lys Glu Lys
 275 280 285
 Phe Gly Ile Glu Leu Asn Arg Glu Val Arg Ile Ile Gly Glu His Pro
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 atgtcatcat gggaatcgct aataagcgta gtattgcttt tgggtgctgct aaagttttag 180
 atcaattagg tgctaaatta gtatttactt accgtaaaga acgtagccgt aaagagcttg 240
 aaaaattatt agaacaatta aatcaaccag aagcgcaactt atatcaaatt gatgttcaaa 300
 gcgatgaaga gggtattaat ggttttgagc aaattggtaa agatgttggc aatattgatg 360
 gtgtatatca ttcaatcgca ttgctaata tggaagactt acgcggacgc ttttctgaaa 420
 cttcacgtga aggcttcttg ttagctcaag acattagttc ttactcatta acaattgttg 480
 ctcatgaagc taaaaaatta atgccagaag gtggtagcat tgttgcaaca acatatttag 540
 gtggcgaatt cgcagttcaa aactataatg tgatgggtgt tgctaaagcg agcttagaag 600
 caaatgttaa atatttagca ttagacttag gtccagataa tattcgcgtt aatgcaattt 660
 cagctagtcc aatccgtaca ttaagtgc aaaggtgtggg tggtttcaat acaattctta 720
 aagaaatcga agagcgtgca cctttaaaac gtaatgttga tcaagtagaa gtaggtaaaa 780
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Glu	Lys	Leu	Leu	Glu	Gln	Leu	Asn	Gln	Pro	Glu	Ala	His	Leu	Tyr	Gln	
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Gly	Lys	Asp	Val	Gly	Asn	Ile	Asp	Gly	Val	Tyr	His	Ser	Ile	Ala	Phe	
65					70					75					80	
Ile	Asp	Val	Gln	Ser	Asp	Glu	Glu	Val	Ile	Asn	Gly	Phe	Glu	Gln	Ile	
				85					90					95		
Ala	Asn	Met	Glu	Asp	Leu	Arg	Gly	Arg	Phe	Ser	Glu	Thr	Ser	Arg	Glu	
			100					105					110			
Gly	Phe	Leu	Leu	Ala	Gln	Asp	Ile	Ser	Ser	Tyr	Ser	Leu	Thr	Ile	Val	
		115					120					125				
Ala	His	Glu	Ala	Lys	Lys	Leu	Met	Pro	Glu	Gly	Gly	Ser	Ile	Val	Ala	
	130					135					140					
Thr	Thr	Tyr	Leu	Gly	Gly	Glu	Phe	Ala	Val	Gln	Asn	Tyr	Asn	Val	Met	
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Gly	Val	Ala	Lys	Ala	Ser	Leu	Glu	Ala	Asn	Val	Lys	Tyr	Leu	Ala	Leu	
				165					170					175		
Asp	Leu	Gly	Pro	Asp	Asn	Ile	Arg	Val	Asn	Ala	Ile	Ser	Ala	Ser	Pro	
			180					185					190			
Ile	Arg	Thr	Leu	Ser	Ala	Lys	Gly	Val	Gly	Gly	Phe	Asn	Thr	Ile	Leu	
		195					200					205				
Lys	Glu	Ile	Glu	Glu	Arg	Ala	Pro	Leu	Lys	Arg	Asn	Val	Asp	Gln	Val	
	210					215					220					
Glu	Val	Gly	Lys	Thr	Ala	Ala	Tyr	Leu	Leu	Ser	Asp	Leu	Ser	Ser	Gly	
225					230					235					240	
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<213> Staphylococcus aureus

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35 40 45
Ser Asp Val Glu Thr Ile Asn Asn Val Leu Thr Thr Leu Asn Ala Asp
50 55 60
Val Thr Tyr Lys Lys Asp Glu Asn Ala Val Val Val Asp Ala Thr Lys
65 70 75 80
Thr Leu Asn Glu Glu Ala Pro Tyr Glu Tyr Val Ser Lys Met Arg Ala
85 90 95
Ser Ile Leu Val Met Gly Pro Leu Leu Ala Arg Leu Gly His Ala Ile
100 105 110
Val Ala Leu Pro Gly Gly Cys Ala Ile Gly Ser Arg Pro Ile Glu Gln
115 120 125
His Ile Lys Gly Phe Glu Ala Leu Gly Ala Glu Ile His Leu Glu Asn
130 135 140
Gly Asn Ile Tyr Ala Asn Ala Lys Asp Gly Leu Lys Gly Thr Ser Ile
145 150 155 160
His Leu Asp Phe Pro Ser Val Gly Ala Thr Gln Asn Ile Ile Met Ala
165 170 175
Ala Ser Leu Ala Lys Gly Lys Thr Leu Ile Glu Asn Ala Ala Lys Glu
180 185 190
Pro Glu Ile Val Asp Leu Ala Asn Tyr Ile Asn Glu Met Gly Gly Arg
195 200 205
Ile Thr Gly Ala Gly Thr Asp Thr Ile Thr Ile Asn Gly Val Glu Ser
210 215 220
Leu His Gly Val Glu His Ala Ile Ile Pro Asp Arg Ile Glu Ala Gly
225 230 235 240
Thr Leu Leu Ile Ala Gly Ala Ile Thr Arg Gly Asp Ile Phe Val Arg
245 250 255
Gly Ala Ile Lys Glu His Met Ala Ser Leu Val Tyr Lys Leu Glu Glu
260 265 270
Met Gly Val Glu Leu Asp Tyr Gln Glu Asp Gly Ile Arg Val Arg Ala
275 280 285

Glu Gly Glu Leu Gln Pro Val Asp Ile Lys Thr Leu Pro His Pro Gly
 290 295 300
 Phe Pro Thr Asp Met Gln Ser Gln Met Met Ala Leu Leu Leu Thr Ala
 305 310 315 320
 Asn Gly His Lys Val Val Thr Glu Thr Val Phe Glu Asn Arg Phe Met
 325 330 335
 His Val Ala Glu Phe Lys Arg Met Asn Ala Asn Ile Asn Val Glu Gly
 340 345 350
 Arg Ser Ala Lys Leu Glu Gly Lys Ser Gln Leu Gln Gly Ala Gln Val
 355 360 365
 Lys Ala Thr Asp Leu Arg Ala Ala Ala Ala Leu Ile Leu Ala Gly Leu
 370 375 380
 Val Ala Asp Gly Lys Thr Ser Val Thr Glu Leu Thr His Leu Asp Arg
 385 390 395 400
 Gly Tyr Val Asp Leu His Gly Lys Leu Lys Gln Leu Gly Ala Asp Ile
 405 410 415
 Glu Arg Ile Asn Asp
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 atgcctgaaa gagaacgtac atctcctcag tatgaatcat tccacgaatt gtacaagaac 180
 tatactacca aggaactcac tcaaaaagct aaaactctta agttgacgaa ccatagtaaa 240
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cctgaagagg taacagattt agaacgctca gtagaagctg ctgaagtcgt tcattcaacg 840
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			20					25					30		
Leu	Lys	Leu	Thr	Asn	His	Ser	Lys	Leu	Asn	Lys	Lys	Glu	Leu	Val	Leu
		35					40					45			
Ala	Ile	Met	Glu	Ala	Gln	Met	Glu	Lys	Asp	Gly	Asn	Tyr	Tyr	Met	Glu
	50					55					60				
Gly	Ile	Leu	Asp	Asp	Ile	Gln	Pro	Gly	Gly	Tyr	Gly	Phe	Leu	Arg	Thr
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Val	Asn	Tyr	Ser	Lys	Gly	Glu	Lys	Asp	Ile	Tyr	Ile	Ser	Ala	Ser	Gln
				85					90					95	
Ile	Arg	Arg	Phe	Glu	Ile	Lys	Arg	Gly	Asp	Lys	Val	Thr	Gly	Lys	Val
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Arg Lys Pro Lys Asp Asn Glu Lys Tyr Tyr Gly Leu Leu Gln Val Asp
 115 120 125
 Phe Val Asn Asp His Asn Ala Glu Glu Val Lys Lys Arg Pro His Phe
 130 135 140
 Gln Ala Leu Thr Pro Leu Tyr Pro Asp Glu Arg Ile Lys Leu Glu Thr
 145 150 155 160
 Glu Ile Gln Asn Tyr Ser Thr Arg Ile Met Asp Leu Val Thr Pro Ile
 165 170 175
 Gly Leu Gly Gln Arg Gly Leu Ile Val Ala Pro Pro Lys Ala Gly Lys
 180 185 190
 Thr Ser Leu Leu Lys Glu Ile Ala Asn Ala Ile Ser Thr Asn Lys Pro
 195 200 205
 Asp Ala Lys Leu Phe Ile Leu Leu Val Gly Glu Arg Pro Glu Glu Val
 210 215 220
 Thr Asp Leu Glu Arg Ser Val Glu Ala Ala Glu Val Val His Ser Thr
 225 230 235 240
 Phe Asp Glu Pro Pro Glu His His Val Lys Val Ala Glu Leu Leu Leu
 245 250 255
 Glu Arg Ala Lys Arg Leu Val Glu Ile Gly Glu Asp Val Ile Ile Leu
 260 265 270
 Met Asp Ser Ile Thr Arg Leu Ala Arg Ala Tyr Asn Leu Val Ile Pro
 275 280 285
 Pro Ser Gly Arg Thr Leu Ser Gly Gly Leu Asp Pro Ala Ser Leu His
 290 295 300
 Lys Pro Lys Ala Phe Phe Gly Ala Ala Arg Asn Ile Glu Ala Gly Gly
 305 310 315 320
 Ser Leu Thr Ile Leu Ala Thr Ala Leu Val Asp Thr Gly Ser Arg Met
 325 330 335
 Asp Asp Met Ile Tyr Glu Glu Phe Lys Gly Thr Gly Asn Met Glu Leu
 340 345 350
 His Leu Asp Arg Lys Leu Ser Glu Arg Arg Ile Phe Pro Ala Ile Asp
 355 360 365
 Ile Gly Arg Ser Ser Thr Arg Lys Glu Glu Leu Leu Ile Ser Lys Ser
 370 375 380
 Glu Leu Asp Thr Leu Trp Gln Leu Arg Asn Leu Phe Thr Asp Ser Thr
 385 390 395 400
 Asp Phe Thr Glu Arg Phe Ile Arg Lys Leu Lys Arg Ser Lys Asn Asn
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Glu Asp Phe Phe Lys Gln Leu Gln Lys Ser Ala Glu Glu Ser Thr Lys
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Thr Gly Arg Pro Ile Ile
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 <213> Staphylococcus aureus

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 cagacaattt gttgtataca cttgtaataa taaagaaata gaccattttc gcttaggtat 240
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 tgaaaatttc aaagtacata agtcgcatat attggccaaa gatattattg taatagcaag 360
 acagccagct aaagatatga cgactttaca aatacagaat agtcttgagc acgtacttaa 420
 aattgccaaa gtttttaata aaaagattaa gtaaggatag ggtaggggaa ggaaaacatt 480
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 taataactta cttt 554

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 <213> Staphylococcus aureus

<400> 12

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 Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val
 20 25 30
 Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser
 35 40 45
 Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg
 50 55 60
 Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys
 65 70 75 80
 Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu

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gattttacgtt ctaaatgtcg	tcgattaaag caagaacatg	gcttagacat gattgtgatt	1200	
gactacttac agttgattca	aggtagtggg tcacgtgcgt	ccgataacag acaacaggaa	1260	
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gatgattact ataaccgtgg cggcgatgaa gatgatgacg atgatgggtgg tttcgagcca 1500
caaacgaatg atgaaaacgg tgaaattgaa attatcattg ctaagcaacg taacgggtcca 1560
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<211> 466
<212> PRT
<213> Staphylococcus aureus

<400> 14

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			20					25					30		
Thr	Thr	Gln	Glu	Val	Leu	Leu	Pro	Glu	Ser	Phe	Tyr	Arg	Gly	Ala	His
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Gln	His	Ile	Phe	Arg	Ala	Met	Met	His	Leu	Asn	Glu	Asp	Asn	Lys	Glu
	50					55					60				
Ile	Asp	Val	Val	Thr	Leu	Met	Asp	Gln	Leu	Ser	Thr	Glu	Gly	Thr	Leu
65					70					75					80
Asn	Glu	Ala	Gly	Gly	Pro	Gln	Tyr	Leu	Ala	Glu	Leu	Ser	Thr	Asn	Val
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Pro	Thr	Thr	Arg	Asn	Val	Gln	Tyr	Tyr	Thr	Asp	Ile	Val	Ser	Lys	His
			100					105					110		
Ala	Leu	Lys	Arg	Arg	Leu	Ile	Gln	Thr	Ala	Asp	Ser	Ile	Ala	Asn	Asp
		115					120					125			
Gly	Tyr	Asn	Asp	Glu	Leu	Glu	Leu	Asp	Ala	Ile	Leu	Ser	Asp	Ala	Glu
	130					135					140				
Arg	Arg	Ile	Leu	Glu	Leu	Ser	Ser	Ser	Arg	Glu	Ser	Asp	Gly	Phe	Lys
145					150					155					160
Asp	Ile	Arg	Asp	Val	Leu	Gly	Gln	Val	Tyr	Glu	Thr	Ala	Glu	Glu	Leu
				165					170					175	
Asp	Gln	Asn	Ser	Gly	Gln	Thr	Pro	Gly	Ile	Pro	Thr	Gly	Tyr	Arg	Asp

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Leu	Asp	Gln	Met	Thr	Ala	Gly	Phe	Asn	Arg	Asn	Asp	Leu	Ile	Ile	Leu						
		195					200					205									
Ala	Ala	Arg	Pro	Ser	Val	Gly	Lys	Thr	Ala	Phe	Ala	Leu	Asn	Ile	Ala						
	210					215					220										
Gln	Lys	Val	Ala	Thr	His	Glu	Asp	Met	Tyr	Thr	Val	Gly	Ile	Phe	Ser						
225					230					235					240						
Leu	Glu	Met	Gly	Ala	Asp	Gln	Leu	Ala	Thr	Arg	Met	Ile	Cys	Ser	Ser						
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			260					265					270								
Asp	Trp	Ser	Arg	Phe	Thr	Ile	Ala	Val	Gly	Lys	Leu	Ser	Arg	Thr	Lys						
		275					280					285									
Ile	Phe	Ile	Asp	Asp	Thr	Pro	Gly	Ile	Arg	Ile	Asn	Asp	Leu	Arg	Ser						
	290					295					300										
Lys	Cys	Arg	Arg	Leu	Lys	Gln	Glu	His	Gly	Leu	Asp	Met	Ile	Val	Ile						
305					310					315					320						
Asp	Tyr	Leu	Gln	Leu	Ile	Gln	Gly	Ser	Gly	Ser	Arg	Ala	Ser	Asp	Asn						
				325					330					335							
Arg	Gln	Gln	Glu	Val	Ser	Glu	Ile	Ser	Arg	Thr	Leu	Lys	Ala	Leu	Ala						
			340					345					350								
Arg	Glu	Leu	Lys	Cys	Pro	Val	Ile	Ala	Leu	Ser	Gln	Leu	Ser	Arg	Gly						
		355					360					365									
Val	Glu	Gln	Arg	Gln	Asp	Lys	Arg	Pro	Met	Met	Ser	Asp	Ile	Arg	Glu						
	370					375					380										
Ser	Gly	Ser	Ile	Glu	Gln	Asp	Ala	Asp	Ile	Val	Ala	Phe	Leu	Tyr	Arg						
385					390					395					400						
Asp	Asp	Tyr	Tyr	Asn	Arg	Gly	Gly	Asp	Glu	Asp	Asp	Asp	Asp	Asp	Gly						
				405					410					415							
Gly	Phe	Glu	Pro	Gln	Thr	Asn	Asp	Glu	Asn	Gly	Glu	Ile	Glu	Ile	Ile						
			420					425					430								
Ile	Ala	Lys	Gln	Arg	Asn	Gly	Pro	Thr	Gly	Thr	Val	Lys	Leu	His	Phe						
		435					440					445									
Met	Lys	Gln	Tyr	Asn	Lys	Phe	Thr	Asp	Ile	Asp	Tyr	Ala	His	Ala	Asp						
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465																					

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<211> 1170
 <212> DNA
 <213> Staphylococcus aureus

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 aaacaatgaa agagactgta ggtgaatcaa atgagtaaaa cagcaattat ttttccggga 180
 caaggtgccc aaaaagttgg tatggcgcaa gatttgttta acaacaatga tcaagcaact 240
 gaaattttta cttcagcagc gaacacatta gactttgata ttttagagac aatgtttact 300
 gatgaagaag gtaaattggg tgaaactgaa aacacacaac cagctttatt gacgcatagt 360
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 ggtgaatatt caagtttagt tgcagctgac gtattatcat ttgaagatgc agttaaatt 480
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 gcagtattgg gattagattt tgataaagtc gatgaaattt gtaagtcatt atcatctgat 600
 gacaaaataa ttgaaccagc aaacattaat tgcccaggtc aaattgttgt ttcaggtcac 660
 aaagctttta ttgatgagct agtagaaaaa ggtaaatcat taggtgcaaa acgtgtcatg 720
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 tcaagttaca ttaatcaatt tgaatggcgt gatgctaagt ttctgtagt tcaaaatgta 840
 aatgcgcaag gtgaaactga caaagaagta attaaatcta atatggtcaa gcaattatat 900
 tcaccagtac aattcattaa ctcaacagaa tggctaatag accaagggtg tgatcatttt 960
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 aagttaacat caattcaaac tttagaagat gtgaaaggat ggaatgaaaa tgactaagag 1080
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<210> 16
 <211> 308
 <212> PRT
 <213> Staphylococcus aureus

<400> 16

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Phe	Thr	Asp	Glu	Glu	Gly	Lys	Leu	Gly	Glu	Thr	Glu	Asn	Thr	Gln	Pro
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Ala	Leu	Leu	Thr	His	Ser	Ser	Ala	Leu	Leu	Ala	Ala	Leu	Lys	Asn	Leu
65					70					75					80
Asn	Pro	Asp	Phe	Thr	Met	Gly	His	Ser	Leu	Gly	Glu	Tyr	Ser	Ser	Leu
				85					90					95	
Val	Ala	Ala	Asp	Val	Leu	Ser	Phe	Glu	Asp	Ala	Val	Lys	Ile	Val	Arg
			100					105					110		
Lys	Arg	Gly	Gln	Leu	Met	Ala	Gln	Ala	Phe	Pro	Thr	Gly	Val	Gly	Ser
		115					120					125			
Met	Ala	Ala	Val	Leu	Gly	Leu	Asp	Phe	Asp	Lys	Val	Asp	Glu	Ile	Cys
	130					135					140				
Lys	Ser	Leu	Ser	Ser	Asp	Asp	Lys	Ile	Ile	Glu	Pro	Ala	Asn	Ile	Asn
145					150					155					160
Cys	Pro	Gly	Gln	Ile	Val	Val	Ser	Gly	His	Lys	Ala	Leu	Ile	Asp	Glu
				165					170						175
Leu	Val	Glu	Lys	Gly	Lys	Ser	Leu	Gly	Ala	Lys	Arg	Val	Met	Pro	Leu
			180					185					190		
Ala	Val	Ser	Gly	Pro	Phe	His	Ser	Ser	Leu	Met	Lys	Val	Ile	Glu	Glu
		195					200					205			
Asp	Phe	Ser	Ser	Tyr	Ile	Asn	Gln	Phe	Glu	Trp	Arg	Asp	Ala	Lys	Phe
	210					215					220				
Pro	Val	Val	Gln	Asn	Val	Asn	Ala	Gln	Gly	Glu	Thr	Asp	Lys	Glu	Val
225					230					235					240
Ile	Lys	Ser	Asn	Met	Val	Lys	Gln	Leu	Tyr	Ser	Pro	Val	Gln	Phe	Ile
				245					250					255	
Asn	Ser	Thr	Glu	Trp	Leu	Ile	Asp	Gln	Gly	Val	Asp	His	Phe	Ile	Glu
			260					265					270		
Ile	Gly	Pro	Gly	Lys	Val	Leu	Ser	Gly	Leu	Ile	Lys	Lys	Ile	Asn	Arg
		275					280					285			
Asp	Val	Lys	Leu	Thr	Ser	Ile	Gln	Thr	Leu	Glu	Asp	Val	Lys	Gly	Trp
	290					295					300				
Asn	Glu	Asn	Asp												
305															

<210> 17

<211> 1080
 <212> DNA
 <213> Staphylococcus aureus

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 agaaatgtta attgatgcaa aagaaaatgg ttatgcggtta ggtcaataca atattaataa 180
 cctagaattc actcaagcaa ttttagaagc gtcacaagaa gaaaatgcac ctgtaatttt 240
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 ttcaagcttt gaaaaatgta aagaagctat cgatgctggg ttcacatcag taatgatcga 420
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 accaaaatta ggattttaaag aaatggaaga aatcggttta tctacagggt taccattagt 720
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 attaataattt agtctttaag ttattaataa cgtagggata ttaattttta aagaagcaga 1020
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<210> 18
 <211> 286
 <212> PRT
 <213> Staphylococcus aureus

<400> 18
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 Ala Ile Leu Glu Ala Ser Gln Glu Glu Asn Ala Pro Val Ile Leu Gly
 35 40 45

Val Ser Glu Gly Ala Ala Arg Tyr Met Ser Gly Phe Tyr Thr Ile Val
 50 55 60
 Lys Met Val Glu Gly Leu Met His Asp Leu Asn Ile Thr Ile Pro Val
 65 70 75 80
 Ala Ile His Leu Asp His Gly Ser Ser Phe Glu Lys Cys Lys Glu Ala
 85 90 95
 Ile Asp Ala Gly Phe Thr Ser Val Met Ile Asp Ala Ser His Ser Pro
 100 105 110
 Phe Glu Glu Asn Val Ala Thr Thr Lys Lys Val Val Glu Tyr Ala His
 115 120 125
 Glu Lys Gly Val Ser Val Glu Ala Glu Leu Gly Thr Val Gly Gly Gln
 130 135 140
 Glu Asp Asp Val Val Ala Asp Gly Ile Ile Tyr Ala Asp Pro Lys Glu
 145 150 155 160
 Cys Gln Glu Leu Val Glu Lys Thr Gly Ile Asp Ala Leu Ala Pro Ala
 165 170 175
 Leu Gly Ser Val His Gly Pro Tyr Lys Gly Glu Pro Lys Leu Gly Phe
 180 185 190
 Lys Glu Met Glu Glu Ile Gly Leu Ser Thr Gly Leu Pro Leu Val Leu
 195 200 205
 His Gly Gly Thr Gly Ile Pro Thr Lys Asp Ile Gln Lys Ala Ile Pro
 210 215 220
 Phe Gly Thr Ala Lys Ile Asn Val Asn Thr Glu Asn Gln Ile Ala Ser
 225 230 235 240
 Ala Lys Ala Val Arg Asp Val Leu Asn Asn Asp Lys Glu Val Tyr Asp
 245 250 255
 Pro Arg Lys Tyr Leu Gly Pro Ala Arg Glu Ala Ile Lys Glu Thr Val
 260 265 270
 Lys Gly Lys Ile Lys Glu Phe Gly Thr Ser Asn Arg Ala Lys
 275 280 285

<210> 19

<211> 1340

<212> DNA

<213> Staphylococcus aureus

<400> 19

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acgactttta aattactatc aaaattgcc aacaagaatc taatttattt tgaaagcttt 180

catggtaaac aatacagcga caaccccaaa gcattatatg aataacttaac tgaacatagc 240
gatgcccaat taatatgggg tgtgaaaaaa ggatatgaac acatattcca acagcacaat 300
gtaccatatg ttacaaagtt ttcaatgaaa tgggttttag cgatgccaaag agcgaaagcg 360
tggatgatta acacacgtac accagattgg ttatataaat caccgcgaac gacgtactta 420
caaacatggc atggcacgcc attaaaaaag attgggttgg atattagtaa cgttaaaatg 480
ctaggaacaa atactcaaaa ttaccaagat ggcttttaaa aagaaagcca acggtgggat 540
tatctagtgt cacctaatcc atattcgaca tcgatatttc aaaatgcatt tcatgttagt 600
cgagataaga ttttggaac aggttatcca agaaatgata aattatcaca taaacgcaat 660
gatactgaat atattaatgg tattaagaca agattaaata ttccattaga taaaaaagtg 720
attatgtacg cgccaacttg gcgtgacgat gaagcgattc gagaaggttc atatcaattt 780
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<210> 20
<211> 389
<212> PRT
<213> Staphylococcus aureus

<400> 20

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Glu Ser Phe His Gly Lys Gln Tyr Ser Asp Asn Pro Lys Ala Leu Tyr
35 40 45

Glu Tyr Leu Thr Glu His Ser Asp Ala Gln Leu Ile Trp Gly Val Lys
 50 55 60
 Lys Gly Tyr Glu His Ile Phe Gln Gln His Asn Val Pro Tyr Val Thr
 65 70 75 80
 Lys Phe Ser Met Lys Trp Phe Leu Ala Met Pro Arg Ala Lys Ala Trp
 85 90 95
 Met Ile Asn Thr Arg Thr Pro Asp Trp Leu Tyr Lys Ser Pro Arg Thr
 100 105 110
 Thr Tyr Leu Gln Thr Trp His Gly Thr Pro Leu Lys Lys Ile Gly Leu
 115 120 125
 Asp Ile Ser Asn Val Lys Met Leu Gly Thr Asn Thr Gln Asn Tyr Gln
 130 135 140
 Asp Gly Phe Lys Lys Glu Ser Gln Arg Trp Asp Tyr Leu Val Ser Pro
 145 150 155 160
 Asn Pro Tyr Ser Thr Ser Ile Phe Gln Asn Ala Phe His Val Ser Arg
 165 170 175
 Asp Lys Ile Leu Glu Thr Gly Tyr Pro Arg Asn Asp Lys Leu Ser His
 180 185 190
 Lys Arg Asn Asp Thr Glu Tyr Ile Asn Gly Ile Lys Thr Arg Leu Asn
 195 200 205
 Ile Pro Leu Asp Lys Lys Val Ile Met Tyr Ala Pro Thr Trp Arg Asp
 210 215 220
 Asp Glu Ala Ile Arg Glu Gly Ser Tyr Gln Phe Asn Val Asn Phe Asp
 225 230 235 240
 Ile Glu Ala Leu Arg Gln Ala Leu Asp Asp Asp Tyr Val Ile Leu Leu
 245 250 255
 Arg Met His Tyr Leu Val Val Thr Arg Ile Asp Glu His Asp Asp Phe
 260 265 270
 Val Lys Asp Val Ser Asp Tyr Glu Asp Ile Ser Asp Leu Tyr Leu Ile
 275 280 285
 Ser Asp Ala Leu Val Thr Asp Tyr Ser Ser Val Met Phe Asp Phe Gly
 290 295 300
 Val Leu Lys Arg Pro Gln Ile Phe Tyr Ala Tyr Asp Leu Asp Lys Tyr
 305 310 315 320
 Gly Asp Glu Leu Arg Gly Phe Tyr Met Asp Tyr Lys Lys Glu Leu Pro
 325 330 335
 Gly Pro Ile Val Glu Asn Gln Thr Ala Leu Ile Asp Ala Leu Lys Gln
 340 345 350

Ile Asp Glu Thr Ala Asn Glu Tyr Ile Glu Ala Arg Thr Val Phe Tyr
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Gln Lys Phe Cys Ser Leu Glu Asp Gly Gln Ala Ser Gln Arg Ile Cys
 370 375 380

Gln Thr Ile Phe Lys
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<210> 21
 <211> 1430
 <212> DNA
 <213> Staphylococcus aureus

<400> 21
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 tatgctaata ctaaagatgg attaaaagg acatcaattc atttagattt tccaagtgt 600
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<210> 22
 <211> 421
 <212> PRT
 <213> Staphylococcus aureus

<400> 22

Met	Asp	Lys	Ile	Val	Ile	Lys	Gly	Gly	Asn	Lys	Leu	Thr	Gly	Glu	Val	1	5	10	15
Lys	Val	Glu	Gly	Ala	Lys	Asn	Ala	Val	Leu	Pro	Ile	Leu	Thr	Ala	Ser	20	25	30	
Leu	Leu	Ala	Ser	Asp	Lys	Pro	Ser	Lys	Leu	Val	Asn	Val	Pro	Ala	Leu	35	40	45	
Ser	Asp	Val	Glu	Thr	Ile	Asn	Asn	Val	Leu	Thr	Thr	Leu	Asn	Ala	Asp	50	55	60	
Val	Thr	Tyr	Lys	Lys	Asp	Glu	Asn	Ala	Val	Val	Val	Asp	Ala	Thr	Lys	65	70	75	
Thr	Leu	Asn	Glu	Glu	Ala	Pro	Tyr	Glu	Tyr	Val	Ser	Lys	Met	Arg	Ala	85	90	95	
Ser	Ile	Leu	Val	Met	Gly	Pro	Leu	Leu	Ala	Arg	Leu	Gly	His	Ala	Ile	100	105	110	
Val	Ala	Leu	Pro	Gly	Gly	Cys	Ala	Ile	Gly	Ser	Arg	Pro	Ile	Glu	Gln	115	120	125	
His	Ile	Lys	Gly	Phe	Glu	Ala	Leu	Gly	Ala	Glu	Ile	His	Leu	Glu	Asn	130	135	140	
Gly	Asn	Ile	Tyr	Ala	Asn	Ala	Lys	Asp	Gly	Leu	Lys	Gly	Thr	Ser	Ile	145	150	155	
His	Leu	Asp	Phe	Pro	Ser	Val	Gly	Ala	Thr	Gln	Asn	Ile	Ile	Met	Ala	165	170	175	
Ala	Ser	Leu	Ala	Lys	Gly	Lys	Thr	Leu	Ile	Glu	Asn	Ala	Ala	Lys	Glu	180	185	190	
Pro	Glu	Ile	Val	Asp	Leu	Ala	Asn	Tyr	Ile	Asn	Glu	Met	Gly	Gly	Arg	195	200	205	
Ile	Thr	Gly	Ala	Gly	Thr	Asp	Thr	Ile	Thr	Ile	Asn	Gly	Val	Glu	Ser	210	215	220	

Leu His Gly Val Glu His Ala Ile Ile Pro Asp Arg Ile Glu Ala Gly
 225 230 235 240
 Thr Leu Leu Ile Ala Gly Ala Ile Thr Arg Gly Asp Ile Phe Val Arg
 245 250 255
 Gly Ala Ile Lys Glu His Met Ala Ser Leu Val Tyr Lys Leu Glu Glu
 260 265 270
 Met Gly Val Glu Leu Asp Tyr Gln Glu Asp Gly Ile Arg Val Arg Ala
 275 280 285
 Glu Gly Glu Leu Gln Pro Val Asp Ile Lys Thr Leu Pro His Pro Gly
 290 295 300
 Phe Pro Thr Asp Met Gln Ser Gln Met Met Ala Leu Leu Leu Thr Ala
 305 310 315 320
 Asn Gly His Lys Val Val Thr Glu Thr Val Phe Glu Asn Arg Phe Met
 325 330 335
 His Val Ala Glu Phe Lys Arg Met Asn Ala Asn Ile Asn Val Glu Gly
 340 345 350
 Arg Ser Ala Lys Leu Glu Gly Lys Ser Gln Leu Gln Gly Ala Gln Val
 355 360 365
 Lys Ala Thr Asp Leu Arg Ala Ala Ala Leu Ile Leu Ala Gly Leu
 370 375 380
 Val Ala Asp Gly Lys Thr Ser Val Thr Glu Leu Thr His Leu Asp Arg
 385 390 395 400
 Gly Tyr Val Asp Leu His Gly Lys Leu Lys Gln Leu Gly Ala Asp Ile
 405 410 415
 Glu Arg Ile Asn Asp
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<210> 23
 <211> 2204
 <212> DNA
 <213> Staphylococcus aureus

<400> 23
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 tgtgaacgag ttacatgatt tattaaatca atacagttat gaatactatg tagaggataa 180
 tccatctgta ccagatagtg aatatgacaa attacttcat gaactgatta aaatagaaga 240
 ggagcatcct gagtataaga ctgtagattc tccaacagtt agagttggcg gtgaagccca 300
 agcctctttc aataaagtca accatgacac gccaatgtta agtttaggga atgcatttaa 360

tgaggatgat ttgagaaaat tgcaccaacg catacgtgaa caaattggca acgttgaata	420
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cgttcaaggt ttaacacgtg gtgatggaac aacagggtgaa gatattaccg aaaatttaaa	540
aacaattcat gcgatacctt tgaaaatgaa agaaccatta aatgtagaag ttcgtggtga	600
agcatatatg ccgagacgtt cattttttacg attaaatgaa gaaaaagaaa aaaatgatga	660
gcagttattt gcaaatacaa gaaacgctgc tgcgggatca ttaagacagt tagattctaa	720
attaacggca aaacgaaagc taagcgtatt tatatatagt gtcaatgatt tcaactgattt	780
caatgcgcgt tcgcaaagtg aagcattaga tgagttagat aaattagggtt ttacaacgaa	840
taaaaataga gcgcgtgtaa ataatatcga tgggtgtttta gagtatattg aaaaatggac	900
aagccaaaga gagtcattac cttatgatat tgatgggatt gttattaagg ttaatgattt	960
agatcaacag gatgagatgg gattcacaca aaaatctcct agatgggcca ttgcttataa	1020
atttcagct gaggaagtag taactaaatt attagatatt gaattaagta ttggacgaac	1080
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cactaaaatt attcaacagc tttatcaaag cgaattaatt aaagatgttg ctgatatttt	1500
ctatttaaca gaagaagatt tattaccttt agacagaatg gggcagaaaa aagttgataa	1560
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attaaaagat aaacatgtta atatgattta taaaggatc aaaacatcag atattgaagg	1860
acatcctgaa tttagtggta aaacgatagt actgactggg aagytacatc aaatgacacg	1920
caatgaagca tctaaatggc ttgcatcaca aggtgctaaa gttacaagta gcgttactaa	1980
aaatacagat gtcgttattg ctggtgaaga tgcagggttca aaattaacaa aagcacaaa	2040
tttaggtatt gaaatttga cagagcaaca atttgtagat aagcaaaatg aattaaatag	2100

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cgctgcttgt ggtaaccata aggatgacca ggctggaaaa gata 2204

<210> 24
<211> 667
<212> PRT
<213> Staphylococcus aureus

<400> 24

Met	Ala	Asp	Leu	Ser	Ser	Arg	Val	Asn	Glu	Leu	His	Asp	Leu	Leu	Asn	1	5	10	15
Gln	Tyr	Ser	Tyr	Glu	Tyr	Tyr	Val	Glu	Asp	Asn	Pro	Ser	Val	Pro	Asp	20	25	30	
Ser	Glu	Tyr	Asp	Lys	Leu	Leu	His	Glu	Leu	Ile	Lys	Ile	Glu	Glu	Glu	35	40	45	
His	Pro	Glu	Tyr	Lys	Thr	Val	Asp	Ser	Pro	Thr	Val	Arg	Val	Gly	Gly	50	55	60	
Glu	Ala	Gln	Ala	Ser	Phe	Asn	Lys	Val	Asn	His	Asp	Thr	Pro	Met	Leu	65	70	75	80
Ser	Leu	Gly	Asn	Ala	Phe	Asn	Glu	Asp	Asp	Leu	Arg	Lys	Phe	Asp	Gln	85	90	95	
Arg	Ile	Arg	Glu	Gln	Ile	Gly	Asn	Val	Glu	Tyr	Met	Cys	Glu	Leu	Lys	100	105	110	
Ile	Asp	Gly	Leu	Ala	Val	Ser	Leu	Lys	Tyr	Val	Asp	Gly	Tyr	Phe	Val	115	120	125	
Gln	Gly	Leu	Thr	Arg	Gly	Asp	Gly	Thr	Thr	Gly	Glu	Asp	Ile	Thr	Glu	130	135	140	
Asn	Leu	Lys	Thr	Ile	His	Ala	Ile	Pro	Leu	Lys	Met	Lys	Glu	Pro	Leu	145	150	155	160
Asn	Val	Glu	Val	Arg	Gly	Glu	Ala	Tyr	Met	Pro	Arg	Arg	Ser	Phe	Leu	165	170	175	
Arg	Leu	Asn	Glu	Gly	Lys	Glu	Lys	Asn	Asp	Glu	Gln	Leu	Phe	Ala	Asn	180	185	190	
Pro	Arg	Asn	Ala	Ala	Ala	Gly	Ser	Leu	Arg	Gln	Leu	Asp	Ser	Lys	Leu	195	200	205	
Thr	Ala	Lys	Arg	Lys	Leu	Ser	Val	Phe	Ile	Tyr	Ser	Val	Asn	Asp	Phe	210	215	220	
Thr	Asp	Phe	Asn	Ala	Arg	Ser	Gln	Ser	Glu	Ala	Leu	Asp	Glu	Leu	Asp	225	230	235	240

Lys Leu Gly Phe Thr Thr Asn Lys Asn Arg Ala Arg Val Asn Asn Ile
 245 250 255
 Asp Gly Val Leu Glu Tyr Ile Glu Lys Trp Thr Ser Gln Arg Glu Ser
 260 265 270
 Leu Pro Tyr Asp Ile Asp Gly Ile Val Ile Lys Val Asn Asp Leu Asp
 275 280 285
 Gln Gln Asp Glu Met Gly Phe Thr Gln Lys Ser Pro Arg Trp Ala Ile
 290 295 300
 Ala Tyr Lys Phe Pro Ala Glu Glu Val Val Thr Lys Leu Leu Asp Ile
 305 310 315 320
 Glu Leu Ser Ile Gly Arg Thr Gly Val Val Thr Pro Thr Ala Ile Leu
 325 330 335
 Glu Pro Val Lys Val Ala Gly Thr Thr Val Ser Arg Ala Ser Leu His
 340 345 350
 Asn Glu Asp Leu Ile His Asp Arg Asp Ile Arg Ile Gly Asp Ser Val
 355 360 365
 Val Val Lys Lys Ala Gly Asp Ile Ile Pro Glu Val Val Arg Ser Ile
 370 375 380
 Pro Glu Arg Arg Pro Glu Asp Ala Val Thr Tyr His Met Pro Thr His
 385 390 395 400
 Cys Pro Ser Cys Gly His Glu Leu Val Arg Ile Glu Gly Glu Val Ala
 405 410 415
 Leu Arg Cys Ile Asn Pro Lys Cys Gln Ala Gln Leu Val Glu Gly Leu
 420 425 430
 Ile His Phe Val Ser Arg Gln Ala Met Asn Ile Asp Gly Leu Gly Thr
 435 440 445
 Lys Ile Ile Gln Gln Leu Tyr Gln Ser Glu Leu Ile Lys Asp Val Ala
 450 455 460
 Asp Ile Phe Tyr Leu Thr Glu Glu Asp Leu Leu Pro Leu Asp Arg Met
 465 470 475 480
 Gly Gln Lys Lys Val Asp Asn Leu Leu Ala Ala Ile Gln Gln Ala Lys
 485 490 495
 Asp Asn Ser Leu Glu Asn Leu Leu Phe Gly Leu Gly Ile Arg His Leu
 500 505 510
 Gly Val Lys Ala Ser Gln Val Leu Ala Glu Lys Tyr Glu Thr Ile Asp
 515 520 525
 Arg Leu Leu Thr Val Thr Glu Ala Glu Leu Val Glu Ile His Asp Ile
 530 535 540

Gly Asp Lys Val Ala Gln Ser Val Val Thr Tyr Leu Glu Asn Glu Asp
 545 550 555 560
 Ile Arg Ala Leu Ile Gln Lys Leu Lys Asp Lys His Val Asn Met Ile
 565 570 575
 Tyr Lys Gly Ile Lys Thr Ser Asp Ile Glu Gly His Pro Glu Phe Ser
 580 585 590
 Gly Lys Thr Ile Val Leu Thr Gly Lys Leu His Gln Met Thr Arg Asn
 595 600 605
 Glu Ala Ser Lys Trp Leu Ala Ser Gln Gly Ala Lys Val Thr Ser Ser
 610 615 620
 Val Thr Lys Asn Thr Asp Val Val Ile Ala Gly Glu Asp Ala Gly Ser
 625 630 635 640
 Lys Leu Thr Lys Ala Gln Ser Leu Gly Ile Glu Ile Trp Thr Glu Gln
 645 650 655
 Gln Phe Val Asp Lys Gln Asn Glu Leu Asn Ser
 660 665

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 <211> 959
 <212> DNA
 <213> Staphylococcus aureus

<400> 25
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 agaattacaa gcgttaaaaag aaattggata catatgcgct aaagtgcgca atacaatgca 180
 agctgcaacc aaaccaggta tctactacgaa agagcttgat aatattgcga aagagttatt 240
 tgaagaatac ggtgctatct ctgcgccaat tcatgatgaa aattttcctg gtcaaacgtg 300
 tattagtgtc aatgaagagg tggcacatgg gattccaagt aagcgtgtca ttcgtgaagg 360
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 ttcatttgtc gttggagaat cagatgatcc aatgaaacaa aaagtatgtg acgtagcaac 480
 gatggcattt gagaatgcaa ttgcaaaagt aaaaccgggt actaagttaa gtaacattgg 540
 taaagcgggt cataatacag ctagacaaaa tgatttgaaa gtcattaaaa acttaacagg 600
 tcatggtgtt ggtttatcat tacatgaagc accagcacat gtacttaatt actttgatcc 660
 aaaagacaaa acattattaa ctgaaggat ggtattagct attgaaccgt ttatctcatc 720
 aaatgcatca tttgttacag aaggtaaaaa tgaatgggct tttgaaacga gcgataaaaag 780

ttttgttgct caaattgagc atacggttat cgtgactaag gatgggtccga ttttaacgac 840
aaagattgaa gaagaatagt tcaacatata ctaagactaa agtatgaaca tcatttagtt 900
ccggagccta ttcatatggg ttccggaact gttttataat aattaagaac acaatcaat 959

<210> 26
<211> 252
<212> PRT
<213> Staphylococcus aureus

<400> 26

Met Ile Val Lys Thr Glu Glu Glu Leu Gln Ala Leu Lys Glu Ile Gly
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Tyr Ile Cys Ala Lys Val Arg Asn Thr Met Gln Ala Ala Thr Lys Pro
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Gly Ile Thr Thr Lys Glu Leu Asp Asn Ile Ala Lys Glu Leu Phe Glu
35 40 45
Glu Tyr Gly Ala Ile Ser Ala Pro Ile His Asp Glu Asn Phe Pro Gly
50 55 60
Gln Thr Cys Ile Ser Val Asn Glu Glu Val Ala His Gly Ile Pro Ser
65 70 75 80
Lys Arg Val Ile Arg Glu Gly Asp Leu Val Asn Ile Asp Val Ser Ala
85 90 95
Leu Lys Asn Gly Tyr Tyr Ala Asp Thr Gly Ile Ser Phe Val Val Gly
100 105 110
Glu Ser Asp Asp Pro Met Lys Gln Lys Val Cys Asp Val Ala Thr Met
115 120 125
Ala Phe Glu Asn Ala Ile Ala Lys Val Lys Pro Gly Thr Lys Leu Ser
130 135 140
Asn Ile Gly Lys Ala Val His Asn Thr Ala Arg Gln Asn Asp Leu Lys
145 150 155 160
Val Ile Lys Asn Leu Thr Gly His Gly Val Gly Leu Ser Leu His Glu
165 170 175
Ala Pro Ala His Val Leu Asn Tyr Phe Asp Pro Lys Asp Lys Thr Leu
180 185 190
Leu Thr Glu Gly Met Val Leu Ala Ile Glu Pro Phe Ile Ser Ser Asn
195 200 205
Ala Ser Phe Val Thr Glu Gly Lys Asn Glu Trp Ala Phe Glu Thr Ser
210 215 220
Asp Lys Ser Phe Val Ala Gln Ile Glu His Thr Val Ile Val Thr Lys

225	230	235	240
Asp Gly Pro Ile Leu Thr Thr Lys Ile Glu Glu Glu			
	245	250	

<210> 27
 <211> 3400
 <212> DNA
 <213> Staphylococcus aureus

<400> 27
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 cgtgaagaag ttgagcatat cgcgaaatctt gcaagacttc aaatttctcc tgaagaaacg 180
 gaagaaatgg ccaacacatt agaaagcatt ttagatttttg caaaacaaaa tgatagcgct 240
 gatacagaag gcgttgaacc tacatatcac gtttttagatt taaaaaacgt tttacgtgaa 300
 gataaagcaa ttaaagggtat tccacaagaa ttagctttga aaaatgccaa agaaacagaa 360
 gatggacaat ttaaagtgcc tacaatcatg aatgaggagg acgcgtaaga tgagcattcg 420
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 agcgctggat aaagaaaatg caatcaaaaa agcgcaagaa ttggatgaat tacaagcaaa 600
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 aaacggatta gaaacaacat gtgcaagtaa aatgttagaa ggttttgtgc caatttacga 720
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 tggcttagta ccatttagct taggttcaga cacaggtggt tcaattagac aaccggctgc 960
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 aatcgtaatta gaagctatct ctggtgcaga tgttaatgac tctacaagt caccagttga 1140
 tgatgtagac ttacatctg aaattggtaa agatattaaa ggattaaaag ttgcattacc 1200
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tgatttatta	acaacaccag	taaacttagc	tggattacct	ggtatctctg	ttccttgtgg	1740
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gtctaaaggt caagctaadc cacaattagt aaatcaacta ttaaaacaag aattagataa 3300
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<210> 28
<211> 485
<212> PRT
<213> Staphylococcus aureus

<400> 28

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Asp Lys Lys Ile Lys Pro Ser Asp Val Val Lys Asp Ile Tyr Asp Ala
20 25 30
Ile Glu Glu Thr Asp Pro Thr Ile Lys Ser Phe Leu Ala Leu Asp Lys
35 40 45
Glu Asn Ala Ile Lys Lys Ala Gln Glu Leu Asp Glu Leu Gln Ala Lys
50 55 60
Asp Gln Met Asp Gly Lys Leu Phe Gly Ile Pro Met Gly Ile Lys Asp
65 70 75 80
Asn Ile Ile Thr Asn Gly Leu Glu Thr Thr Cys Ala Ser Lys Met Leu
85 90 95
Glu Gly Phe Val Pro Ile Tyr Glu Ser Thr Val Met Glu Lys Leu His
100 105 110
Asn Glu Asn Ala Val Leu Ile Gly Lys Leu Asn Met Asp Glu Phe Ala
115 120 125
Met Gly Gly Ser Thr Glu Thr Ser Tyr Phe Lys Lys Thr Val Asn Pro
130 135 140
Phe Asp His Lys Ala Val Pro Gly Gly Ser Ser Gly Gly Ser Ala Ala
145 150 155 160
Ala Val Ala Ala Gly Leu Val Pro Phe Ser Leu Gly Ser Asp Thr Gly
165 170 175
Gly Ser Ile Arg Gln Pro Ala Ala Tyr Cys Gly Val Val Gly Met Lys
180 185 190
Pro Thr Tyr Gly Arg Val Ser Arg Phe Gly Leu Val Ala Phe Ala Ser
195 200 205

Ser Leu Asp Gln Ile Gly Pro Leu Thr Arg Asn Val Lys Asp Asn Ala
 210 215 220
 Ile Val Leu Glu Ala Ile Ser Gly Ala Asp Val Asn Asp Ser Thr Ser
 225 230 235 240
 Ala Pro Val Asp Asp Val Asp Phe Thr Ser Glu Ile Gly Lys Asp Ile
 245 250 255
 Lys Gly Leu Lys Val Ala Leu Pro Lys Glu Tyr Leu Gly Glu Gly Val
 260 265 270
 Ala Asp Asp Val Lys Glu Ala Val Gln Asn Ala Val Glu Thr Leu Lys
 275 280 285
 Ser Leu Gly Ala Val Val Glu Glu Val Ser Leu Pro Asn Thr Lys Phe
 290 295 300
 Gly Ile Pro Ser Tyr Tyr Val Ile Ala Ser Ser Glu Ala Ser Ser Asn
 305 310 315 320
 Leu Ser Arg Phe Asp Gly Ile Arg Tyr Gly Tyr His Ser Lys Glu Ala
 325 330 335
 His Ser Leu Glu Glu Leu Tyr Lys Met Ser Arg Ser Glu Gly Phe Gly
 340 345 350
 Lys Glu Val Lys Arg Arg Ile Phe Leu Gly Thr Phe Ala Leu Ser Ser
 355 360 365
 Gly Tyr Tyr Asp Ala Tyr Tyr Lys Lys Ser Gln Lys Val Arg Thr Leu
 370 375 380
 Ile Lys Asn Asp Phe Asp Lys Val Phe Glu Asn Tyr Asp Val Val Val
 385 390 395 400
 Gly Pro Thr Ala Pro Thr Thr Ala Phe Asn Leu Gly Glu Glu Ile Asp
 405 410 415
 Asp Pro Leu Thr Met Tyr Ala Asn Asp Leu Leu Thr Thr Pro Val Asn
 420 425 430
 Leu Ala Gly Leu Pro Gly Ile Ser Val Pro Cys Gly Gln Ser Asn Gly
 435 440 445
 Arg Pro Ile Gly Leu Gln Phe Ile Gly Lys Pro Phe Asp Glu Lys Thr
 450 455 460
 Leu Tyr Arg Val Ala Tyr Gln Tyr Glu Thr Gln Tyr Asn Leu His Asp
 465 470 475 480
 Val Tyr Glu Lys Leu
 485

<210> 29
 <211> 475

<212> PRT

<213> Staphylococcus aureus

<400> 29

Met His Phe Glu Thr Val Ile Gly Leu Glu Val His Val Glu Leu Lys
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Thr Asp Ser Lys Met Phe Ser Pro Ser Pro Ala His Phe Gly Ala Glu
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Pro Asn Ser Asn Thr Asn Val Ile Asp Leu Ala Tyr Pro Gly Val Leu
35 40 45
Pro Val Val Asn Lys Arg Ala Val Asp Trp Ala Met Arg Ala Ala Met
50 55 60
Ala Leu Asn Met Glu Ile Ala Thr Glu Ser Lys Phe Asp Arg Lys Asn
65 70 75 80
Tyr Phe Tyr Pro Asp Asn Pro Lys Ala Tyr Gln Ile Ser Gln Phe Asp
85 90 95
Gln Pro Ile Gly Glu Asn Gly Tyr Ile Asp Ile Glu Val Asp Gly Glu
100 105 110
Thr Lys Arg Ile Gly Ile Thr Arg Leu His Met Glu Glu Asp Ala Gly
115 120 125
Lys Ser Thr His Lys Gly Glu Tyr Ser Leu Val Asp Leu Asn Arg Gln
130 135 140
Gly Thr Pro Leu Ile Glu Ile Val Ser Glu Pro Asp Ile Arg Ser Pro
145 150 155 160
Lys Glu Ala Tyr Ala Tyr Leu Glu Lys Leu Arg Ser Ile Ile Gln Tyr
165 170 175
Thr Gly Val Ser Asp Val Lys Met Glu Glu Gly Ser Leu Arg Cys Asp
180 185 190
Ala Asn Ile Ser Leu Arg Pro Tyr Gly Gln Glu Lys Phe Gly Thr Lys
195 200 205
Ala Glu Leu Lys Asn Leu Asn Ser Phe Asn Tyr Val Arg Lys Gly Leu
210 215 220
Glu Tyr Glu Glu Lys Arg Gln Glu Glu Glu Leu Leu Asn Gly Gly Glu
225 230 235 240
Ile Gly Gln Glu Thr Arg Arg Phe Asp Glu Ser Thr Gly Lys Thr Ile
245 250 255
Leu Met Arg Val Lys Glu Gly Ser Asp Asp Tyr Arg Tyr Phe Pro Glu
260 265 270
Pro Asp Ile Val Pro Leu Tyr Ile Asp Asp Ala Trp Lys Glu Arg Val

275					280					285					
Arg	Gln	Thr	Ile	Pro	Glu	Leu	Pro	Asp	Glu	Arg	Lys	Ala	Lys	Tyr	Val
290						295					300				
Asn	Glu	Leu	Gly	Leu	Pro	Ala	Tyr	Asp	Ala	His	Val	Leu	Thr	Leu	Thr
305					310					315					320
Lys	Glu	Met	Ser	Asp	Phe	Phe	Glu	Ser	Thr	Ile	Glu	His	Gly	Ala	Asp
				325					330					335	
Val	Lys	Leu	Thr	Ser	Asn	Trp	Leu	Met	Gly	Gly	Val	Asn	Glu	Tyr	Leu
			340					345					350		
Asn	Lys	Asn	Gln	Val	Glu	Leu	Leu	Asp	Thr	Lys	Leu	Thr	Pro	Glu	Asn
		355					360					365			
Leu	Ala	Gly	Met	Ile	Lys	Leu	Ile	Glu	Asp	Gly	Thr	Met	Ser	Ser	Lys
	370					375					380				
Ile	Ala	Lys	Lys	Val	Phe	Pro	Glu	Leu	Ala	Ala	Lys	Gly	Gly	Asn	Ala
385					390					395					400
Lys	Gln	Ile	Met	Glu	Asp	Asn	Gly	Leu	Val	Gln	Ile	Ser	Asp	Glu	Ala
				405				410						415	
Thr	Leu	Leu	Lys	Phe	Val	Asn	Glu	Ala	Leu	Asp	Asn	Asn	Glu	Gln	Ser
			420					425					430		
Val	Glu	Asp	Tyr	Lys	Asn	Gly	Lys	Gly	Lys	Ala	Met	Gly	Phe	Leu	Val
	435					440						445			
Gly	Gln	Ile	Met	Lys	Ala	Ser	Lys	Gly	Gln	Ala	Asn	Pro	Gln	Leu	Val
	450					455					460				
Asn	Gln	Leu	Leu	Lys	Gln	Glu	Leu	Asp	Lys	Arg					
465					470					475					

<210> 30
 <211> 100
 <212> PRT
 <213> Staphylococcus aureus
 <400> 30

Met	Thr	Lys	Val	Thr	Arg	Glu	Glu	Val	Glu	His	Ile	Ala	Asn	Leu	Ala
1				5					10					15	
Arg	Leu	Gln	Ile	Ser	Pro	Glu	Glu	Thr	Glu	Glu	Met	Ala	Asn	Thr	Leu
		20						25					30		
Glu	Ser	Ile	Leu	Asp	Phe	Ala	Lys	Gln	Asn	Asp	Ser	Ala	Asp	Thr	Glu
	35						40					45			
Gly	Val	Glu	Pro	Thr	Tyr	His	Val	Leu	Asp	Leu	Gln	Asn	Val	Leu	Arg
	50					55					60				

Glu Asp Lys Ala Ile Lys Gly Ile Pro Gln Glu Leu Ala Leu Lys Asn
65 70 75 80

Ala Lys Glu Thr Glu Asp Gly Gln Phe Lys Val Pro Thr Ile Met Asn
85 90 95

Glu Glu Asp Ala
100

<210> 31
<211> 772
<212> DNA
<213> Staphylococcus aureus

<400> 31
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ataataataa atgaaacaat tatgttggag gtaaacacgc atgaaatgta ttgtaggtct 120
aggtaatata ggtaaacgtt ttgaacttac aagacataat atcggctttg aagtcgttga 180
ttatatattta gagaaaaata atttttcatt agataaacia aagtttaag gtgcatatac 240
aattgaacga atgaacggcg ataaagtgtt atttatcgaa ccaatgacaa tgatgaattt 300
gtcaggtgaa gcagttgcac cgattatgga ttattacaat gttaatccag aagatttaat 360
tgtcttatat gatgatttag atttagaaca aggacaagtt cgcttaagac aaaaaggaag 420
tgcgggcggt cacaatggta tgaaatcaat tattaatatg cttggtacag accaatttaa 480
acgtattcgt attggtgtgg gaagaccaac gaatggtatg acggtacctg attatgtttt 540
acaacgcttt tcaaatgatg aaatggtaac gatggaaaaa gttatcgaac acgcagcacg 600
cgcaattgaa aagtttgttg aaacatcacg atttgaccat gttatgaatg aatttaatgg 660
tgaagtgaia taatgacaat attgacaacg cttataaaaag aagataatca ttttcaagac 720
cttaatcagg tatttggaca agcaaacaca ctagtaactg gtctttcccc gt 772

<210> 32
<211> 190
<212> PRT
<213> Staphylococcus aureus

<400> 32

Met Lys Cys Ile Val Gly Leu Gly Asn Ile Gly Lys Arg Phe Glu Leu
1 5 10 15

Thr Arg His Asn Ile Gly Phe Glu Val Val Asp Tyr Ile Leu Glu Lys
20 25 30

Asn Asn Phe Ser Leu Asp Lys Gln Lys Phe Lys Gly Ala Tyr Thr Ile
35 40 45

Glu Arg Met Asn Gly Asp Lys Val Leu Phe Ile Glu Pro Met Thr Met
 50 55 60
 Met Asn Leu Ser Gly Glu Ala Val Ala Pro Ile Met Asp Tyr Tyr Asn
 65 70 75 80
 Val Asn Pro Glu Asp Leu Ile Val Leu Tyr Asp Asp Leu Asp Leu Glu
 85 90 95
 Gln Gly Gln Val Arg Leu Arg Gln Lys Gly Ser Ala Gly Gly His Asn
 100 105 110
 Gly Met Lys Ser Ile Ile Lys Met Leu Gly Thr Asp Gln Phe Lys Arg
 115 120 125
 Ile Arg Ile Gly Val Gly Arg Pro Thr Asn Gly Met Thr Val Pro Asp
 130 135 140
 Tyr Val Leu Gln Arg Phe Ser Asn Asp Glu Met Val Thr Met Glu Lys
 145 150 155 160
 Val Ile Glu His Ala Ala Arg Ala Ile Glu Lys Phe Val Glu Thr Ser
 165 170 175
 Arg Phe Asp His Val Met Asn Glu Phe Asn Gly Glu Val Lys
 180 185 190

<210> 33
 <211> 1277
 <212> DNA
 <213> Staphylococcus aureus

<400> 33
 tgatccgatt atcttagtag gtgccaatga aagttatgag ccacgttgct gcgcgcacca 60
 tatcgtagca cctagtata ataataagga ggaattataa gtgtttgatc aattagatat 120
 tgtagaagaa agatacgaac agttaaatga actgttaagt gaccagatg ttgtaaatga 180
 ttcagataaa ttacgtaaat attctaaaga gcaagctgat ttacaaaaaa ctgtagatgt 240
 ttatcgtaac tataaagcta aaaaagaaga attagctgat attgaagaaa tgttaagtga 300
 gactgatgat aaagaagaag tagaaatgtt aaaagaggag agtaatggta ttaaagctga 360
 acttccaaat cttgaagaag agcttaaaat attattgatt cctaaagatc ctaatgatga 420
 caaagacgtt attgtagaaa taagagcagc agcaggtggt gatgaggctg cgatttttgc 480
 tgggtgattta atgcgtatgt attcaaagta tgctgaatca caaggattca aaactgaaat 540
 agtagaagcg tctgaaagt accatggtgg ttacaaagaa attagtttct cagtttctgg 600
 taatggcgcg tatagtaaatt gaaatttga aaatggtgcg caccgcgttc aacgtgtgcc 660
 tgaaacagaa tcaggtggac gtattcatat ttcaacagct acagtggcag ttttaccaga 720

agttgaagat gtagaaattg aaattagaaa tgaagattta aaaatcgaca cgtatcgttc 780
 aagtgggtgca ggtgggtcagc acgtaaacac aactgactct gcagtacgta ttacccattt 840
 accaactggt gtcattgcaa catcttctga gaagtctcaa attcaaaacc gtgaaaaagc 900
 aatgaaagtg ttaaaagcac gtttatacga tatgaaagtt caagaagaac aacaaaagta 960
 tgcgtcaciaa cgtaaatacag cagtcggtac tggatgatcgt tcagaacgta ttcgaactta 1020
 taattatcca caaagccgtg taacagacca tcgtataggt ctaacgcttc aaaaattagg 1080
 gcaaattatg gaaggccatt tagaagaaat tatagatgca ctgactttat cagagcagac 1140
 agataaattg aaagaactta ataatggtga attataaaga aaagtttagat gaagcaattc 1200
 atttaacaca acaaaaaggg tttgaacaaa cagagctga atggttaatg ttagatgtat 1260
 ttcaatggac gcgtacg 1277

<210> 34
 <211> 358
 <212> PRT
 <213> Staphylococcus aureus

<400> 34

Val	Phe	Asp	Gln	Leu	Asp	Ile	Val	Glu	Glu	Arg	Tyr	Glu	Gln	Leu	Asn
1				5				10						15	
Glu	Leu	Leu	Ser	Asp	Pro	Asp	Val	Val	Asn	Asp	Ser	Asp	Lys	Leu	Arg
			20					25					30		
Lys	Tyr	Ser	Lys	Glu	Gln	Ala	Asp	Leu	Gln	Lys	Thr	Val	Asp	Val	Tyr
		35					40					45			
Arg	Asn	Tyr	Lys	Ala	Lys	Lys	Glu	Glu	Leu	Ala	Asp	Ile	Glu	Glu	Met
	50					55					60				
Leu	Ser	Glu	Thr	Asp	Asp	Lys	Glu	Glu	Val	Glu	Met	Leu	Lys	Glu	Glu
65				70					75					80	
Ser	Asn	Gly	Ile	Lys	Ala	Glu	Leu	Pro	Asn	Leu	Glu	Glu	Glu	Leu	Lys
			85					90						95	
Ile	Leu	Leu	Ile	Pro	Lys	Asp	Pro	Asn	Asp	Asp	Lys	Asp	Val	Ile	Val
		100						105					110		
Glu	Ile	Arg	Ala	Ala	Ala	Gly	Gly	Asp	Glu	Ala	Ala	Ile	Phe	Ala	Gly
	115						120					125			
Asp	Leu	Met	Arg	Met	Tyr	Ser	Lys	Tyr	Ala	Glu	Ser	Gln	Gly	Phe	Lys
	130					135					140				
Thr	Glu	Ile	Val	Glu	Ala	Ser	Glu	Ser	Asp	His	Gly	Gly	Tyr	Lys	Glu

145		150		155		160
Ile Ser Phe Ser Val Ser Gly Asn Gly Ala Tyr Ser Lys Leu Lys Phe						
	165		170		175	
Glu Asn Gly Ala His Arg Val Gln Arg Val Pro Glu Thr Glu Ser Gly						
	180		185		190	
Gly Arg Ile His Thr Ser Thr Ala Thr Val Ala Val Leu Pro Glu Val						
	195		200		205	
Glu Asp Val Glu Ile Glu Ile Arg Asn Glu Asp Leu Lys Ile Asp Thr						
	210		215		220	
Tyr Arg Ser Ser Gly Ala Gly Gly Gln His Val Asn Thr Thr Asp Ser						
	225		230		235	240
Ala Val Arg Ile Thr His Leu Pro Thr Gly Val Ile Ala Thr Ser Ser						
	245		250		255	
Glu Lys Ser Gln Ile Gln Asn Arg Glu Lys Ala Met Lys Val Leu Lys						
	260		265		270	
Ala Arg Leu Tyr Asp Met Lys Val Gln Glu Glu Gln Gln Lys Tyr Ala						
	275		280		285	
Ser Gln Arg Lys Ser Ala Val Gly Thr Gly Asp Arg Ser Glu Arg Ile						
	290		295		300	
Arg Thr Tyr Asn Tyr Pro Gln Ser Arg Val Thr Asp His Arg Ile Gly						
	305		310		315	320
Leu Thr Leu Gln Lys Leu Gly Gln Ile Met Glu Gly His Leu Glu Glu						
	325		330		335	
Ile Ile Asp Ala Leu Thr Leu Ser Glu Gln Thr Asp Lys Leu Lys Glu						
	340		345		350	
Leu Asn Asn Gly Glu Leu						
	355					

<210> 35
 <211> 1315
 <212> DNA
 <213> Staphylococcus aureus

<400> 35	
atttcttaac attgttattt aacaaaatta tggttaaatt tagcattata aaagatgcaa	60
atcaatgact tgaattgaaa tataaatagg agcgaatgct atggaattat cagaaatcaa	120
acgaaatata gataagtata atcaagattt aacacaaatt aggggggtctc ttgacttaga	180
gaacaaagaa actaatattc aagaatatga agaaatgatg gcagaacctt attttggga	240
taaccaaacg aaagcgcaag atattataga taaaaataat gcgttaaaag caatagttaa	300

tgggtataaa acactacaag cagaagtaga tgacatggat gctacttggg atttattaca 360
 agaagaatth gatgaagaaa tgaaagaaga cttagagcaa gaggtcatta attttaaggc 420
 taaagtggat gaatacgaat tgcaattatt attagatggg cctcacgatg ccaataacgc 480
 aattctagag ttacatcctg gtgcagggtg cacggagtct caagattggg ctaatatgct 540
 atttagaatg tatcaacgth attgtgagaa gaaaggctth aaagttgaaa ctgttgatta 600
 tctacctggg gatgaagcgg ggattaaaag tgtaacattg ctcatcaaag ggcataatgc 660
 ttatggttat ttaaaagctg aaaaagggtg acaccgacta gtacgaatth ctccatttga 720
 ttcacagga cgtcgtcata catcatthgc atcatgcgac gttattccag attttaataa 780
 tgatgaaata gagattgaaa tcaatccgga tgatattaca gttgatacat tcagagcttc 840
 tgggtgcagg gtgcagcata ttaacaaaac tgaatcggca atacgaatta cccaccaccc 900
 ctcagggtata gttgttaata accaaaatga acgttctcaa attaaaaacc gtgaagcagc 960
 tatgaaaatg ttaaagtcta aattatatca attaaaattg gaagagcagg cacgtgaaat 1020
 ggctgaaatt cgtggcgaac aaaaagaaat cggctgggga agccaaatta gatcatatgt 1080
 tttccatcca tactcaatgg tgaaagatca tcgtacgaac gaagaaacag gtaaggttga 1140
 tgcagtgatg gatggagaca ttggaccatt tatcgaatca tatttaagac agacaatgtc 1200
 gcacgattaa tatatattht aaaaccgagg ctctaaaagg gcgtcggtht ttggththt 1260
 taaaggtagc taaataaatt gtaaattaga tthtgaata tgatttgtht atgaa 1315

<210> 36
 <211> 369
 <212> PRT
 <213> Staphylococcus aureus

<400> 36

Met	Glu	Leu	Ser	Glu	Ile	Lys	Arg	Asn	Ile	Asp	Lys	Tyr	Asn	Gln	Asp
1			5					10						15	
Leu	Thr	Gln	Ile	Arg	Gly	Ser	Leu	Asp	Leu	Glu	Asn	Lys	Glu	Thr	Asn
		20					25						30		
Ile	Gln	Glu	Tyr	Glu	Glu	Met	Met	Ala	Glu	Pro	Asn	Phe	Trp	Asp	Asn
		35				40						45			
Gln	Thr	Lys	Ala	Gln	Asp	Ile	Ile	Asp	Lys	Asn	Asn	Ala	Leu	Lys	Ala
	50				55					60					
Ile	Val	Asn	Gly	Tyr	Lys	Thr	Leu	Gln	Ala	Glu	Val	Asp	Asp	Met	Asp
65					70				75					80	

Ala Thr Trp Asp Leu Leu Gln Glu Glu Phe Asp Glu Glu Met Lys Glu
 85 90 95
 Asp Leu Glu Gln Glu Val Ile Asn Phe Lys Ala Lys Val Asp Glu Tyr
 100 105 110
 Glu Leu Gln Leu Leu Leu Asp Gly Pro His Asp Ala Asn Asn Ala Ile
 115 120 125
 Leu Glu Leu His Pro Gly Ala Gly Gly Thr Glu Ser Gln Asp Trp Ala
 130 135 140
 Asn Met Leu Phe Arg Met Tyr Gln Arg Tyr Cys Glu Lys Lys Gly Phe
 145 150 155 160
 Lys Val Glu Thr Val Asp Tyr Leu Pro Gly Asp Glu Ala Gly Ile Lys
 165 170 175
 Ser Val Thr Leu Leu Ile Lys Gly His Asn Ala Tyr Gly Tyr Leu Lys
 180 185 190
 Ala Glu Lys Gly Val His Arg Leu Val Arg Ile Ser Pro Phe Asp Ser
 195 200 205
 Ser Gly Arg Arg His Thr Ser Phe Ala Ser Cys Asp Val Ile Pro Asp
 210 215 220
 Phe Asn Asn Asp Glu Ile Glu Ile Glu Ile Asn Pro Asp Asp Ile Thr
 225 230 235 240
 Val Asp Thr Phe Arg Ala Ser Gly Ala Gly Gly Gln His Ile Asn Lys
 245 250 255
 Thr Glu Ser Ala Ile Arg Ile Thr His His Pro Ser Gly Ile Val Val
 260 265 270
 Asn Asn Gln Asn Glu Arg Ser Gln Ile Lys Asn Arg Glu Ala Ala Met
 275 280 285
 Lys Met Leu Lys Ser Lys Leu Tyr Gln Leu Lys Leu Glu Glu Gln Ala
 290 295 300
 Arg Glu Met Ala Glu Ile Arg Gly Glu Gln Lys Glu Ile Gly Trp Gly
 305 310 315 320
 Ser Gln Ile Arg Ser Tyr Val Phe His Pro Tyr Ser Met Val Lys Asp
 325 330 335
 His Arg Thr Asn Glu Glu Thr Gly Lys Val Asp Ala Val Met Asp Gly
 340 345 350
 Asp Ile Gly Pro Phe Ile Glu Ser Tyr Leu Arg Gln Thr Met Ser His
 355 360 365
 Asp

<210> 37
 <211> 840
 <212> DNA
 <213> Staphylococcus aureus

<400> 37
 aataactgaa aatatgatag aattggtaaa tgaatatctg gaaactggaa tgatagttga 60
 aggaattaaa aataataaaa ttttagttga ggatgaataa aatgtcagct tttataactt 120
 ttgagggccc agaaggctct ggaaaaacaa ctgtaattaa tgaagtttac catagattag 180
 taaaagatta tgatgtcatt atgactagag aaccagggtg tgttcctact ggtgaagaaa 240
 tacgtaaaat tgtattagaa ggcaatgata tggacattag aactgaagca atgttatttg 300
 ctgcatctag aagagaacat cttgtattaa aggtcatacc agctttaaaa gaaggtaagg 360
 ttgtgttgtg tgatcgctat atcgatagtt cattagctta tcaaggttat gctagaggga 420
 ttggcgttga agaagtaaga gcattaaacg aatttgcaat aaatggatta tatccagact 480
 tgacgattta tttaaatggt agtgctgaag taggtcgcg aactgattatt aaaaattcaa 540
 gagatcaaaa tagattagat caagaagatt taaagtttca cgaaaaagta attgaagggt 600
 accaagaaat cattcataat gaatcacaac ggttcaaaaag cgттаатgca gatcaacctc 660
 ttgaaaatgt tgttgaagac acgtatcaaa ctatcatcaa atatttagaa aagatatgat 720
 ataattgtta gaagagggtg tataaaatga aaatgattat agcgatcgta caagatcaag 780
 atagtcagga acttgcagat caacttggtta aaaataactt tagagcaaca aaattggcaa 840

<210> 38
 <211> 205
 <212> PRT
 <213> Staphylococcus aureus

<400> 38
 Met Ser Ala Phe Ile Thr Phe Glu Gly Pro Glu Gly Ser Gly Lys Thr
 1 5 10 15
 Thr Val Ile Asn Glu Val Tyr His Arg Leu Val Lys Asp Tyr Asp Val
 20 25 30
 Ile Met Thr Arg Glu Pro Gly Gly Val Pro Thr Gly Glu Glu Ile Arg
 35 40 45
 Lys Ile Val Leu Glu Gly Asn Asp Met Asp Ile Arg Thr Glu Ala Met
 50 55 60
 Leu Phe Ala Ala Ser Arg Arg Glu His Leu Val Leu Lys Val Ile Pro
 65 70 75 80

Ala Leu Lys Glu Gly Lys Val Val Leu Cys Asp Arg Tyr Ile Asp Ser
85 90 95

Ser Leu Ala Tyr Gln Gly Tyr Ala Arg Gly Ile Gly Val Glu Glu Val
100 105 110

Arg Ala Leu Asn Glu Phe Ala Ile Asn Gly Leu Tyr Pro Asp Leu Thr
115 120 125

Ile Tyr Leu Asn Val Ser Ala Glu Val Gly Arg Glu Arg Ile Ile Lys
130 135 140

Asn Ser Arg Asp Gln Asn Arg Leu Asp Gln Glu Asp Leu Lys Phe His
145 150 155 160

Glu Lys Val Ile Glu Gly Tyr Gln Glu Ile Ile His Asn Glu Ser Gln
165 170 175

Arg Phe Lys Ser Val Asn Ala Asp Gln Pro Leu Glu Asn Val Val Glu
180 185 190

Asp Thr Tyr Gln Thr Ile Ile Lys Tyr Leu Glu Lys Ile
195 200 205

<210> 39
<211> 923
<212> DNA
<213> Staphylococcus aureus

<400> 39
aatgttgctt tattaaaatg taaatcattc taataaaacg acaactgtgt cttctttact 60
tgtatatgtt acatatattc acgatagaga ggataagaaa atggctcaaa tttctaaata 120
taaacgtgta gttttgaaac taagtggtag agcgtagct ggagaaaaag gatttggcat 180
aaatccagta attattaaaa gtgttgctga gcaagtggct gaagttgcta aaatggactg 240
tgaaatcgca gtaatcgttg gtggcggaaa catttgagaga ggtaaaacag gtagtgactt 300
aggtatggac cgtggaactg ctgattacat gggtatgctt gcaactgtaa tgaatgcctt 360
agcattacaa gatagtttag aacaattgga ttgtgataca cgagtattaa catctattga 420
aatgaagcaa gtggctgaac cttatattcg tcgtcgtgca attagacact tagaaaagaa 480
acgcgtagtt atttttgctg caggtattgg aaaccatac ttctctacag atactacagc 540
ggcattacgt gctgcagaag ttgaagcaga tggtatttta atgggcaaaa ataatgtaga 600
tggtgtatat tctgcagatc ctaaagtaaa caaagatgcg gtaaaatatg aacatttaac 660
gcatattcaa atgcttcaag aaggtttaca agtaatggat tcaacagcat cctcattctg 720
tatggataat aacattccgt taactgtttt ctctattatg gaagaaggaa atattaaacg 780
tgctgttatg ggtgaaaaga taggtacgtt aattacaaaa taaatttaga ggtgtaaaat 840

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aatgagtgc attattaatg aaactaaatc aagaatgcaa aaatcaatcg aaagcttattc 900
acgtgaatta gctaacatca gtg 923
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<210> 40
<211> 240
<212> PRT
<213> Staphylococcus aureus
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Met Ala Gln Ile Ser Lys Tyr Lys Arg Val Val Leu Lys Leu Ser Gly
1 5 10 15

Lys Ser Val Ala Glu Gln Val Ala Glu Val Ala Lys Met Asp Cys Glu
35 40 45

Ser Asp Leu Gly Met Asp Arg Gly Thr Ala Asp Tyr Met Gly Met Leu
65 70 75 80

Asp Cys Asp Thr Arg Val Leu Thr Ser Ile Glu Met Lys Gln Val Ala
100 105 110

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Val Val Ile Phe Ala Ala Gly Ile Gly Asn Pro Tyr Phe Ser Thr Asp
      130                      135                      140

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Met Gly Lys Asn Asn Val Asp Gly Val Tyr Ser Ala Asp Pro Lys Val
165 170 175

Gln Glu Gly Leu Gln Val Met Asp Ser Thr Ala Ser Ser Phe Cys Met
195 200 205

Ile Lys Arg Ala Val Met Gly Glu Lys Ile Gly Thr Leu Ile Thr Lys
225 230 235 240

<210> 41
 <211> 1013
 <212> DNA
 <213> Staphylococcus aureus

<400> 41
 gatagcatcc atgtatagtg atagtattta caacaattat tataatacta tttagttaag 60
 tagagaaata gttaaacatt tgaaagtgtg gtttaatgga atgtcagcaa taggaacagt 120
 ttttaaagaa catgtaaaga acttttattt aattcaaaga ctggctcagt ttcaagttaa 180
 aattatcaat catagtaact atttaggtgt ggcttgggaa ttaattaacc ctgttatgca 240
 aattatgggt tactggatgg ttttgggatt aggaataaga agtaatgcac caattcatgg 300
 tgtacctttt gtttatttgt tattgggttg tatcagtatg tggttcttca tcaaccaagg 360
 tatttttagaa ggtactaaag caattacaca aaagtttaat caagtatcga aaatgaactt 420
 cccgttatcg ataataccga catatatgtg gacaagtaga ttttatggac atttaggctt 480
 acttttactt gtgataattg catgtatgtt tactgggtatt tatccatcaa tacatatcat 540
 tcaattattg atatatgtac cgttttgttt tttcttaact gcctcgggtga cgttattaac 600
 atcaacactc ggtgtgttag ttagagatac acaaagtta atgcaagcaa tattaagaat 660
 attattttac ttttcaccaa ttttgtggct accaaagaac catgggtatca gtgggtttaat 720
 tcatgaaatg atgaaatata atccagttta ctttattgct gaatcatacc gtgcagcaat 780
 tttatatcac gaatgggtatt tcatggatca ttggaaatta atgttataca atttcgggtat 840
 tgttgccatt ttctttgcaa ttgggtgcgt cttacacatg aaatatagag atcaatttgc 900
 agacttcttg taatatattt atatgacgaa accccgctaa ccattaataa atggaagtgg 960
 ggttcatttt tgtttataat ttaagtaa ataatattaa gttggtgtat tat 1013

<210> 42
 <211> 270
 <212> PRT
 <213> Staphylococcus aureus

<400> 42
 Met Ser Ala Ile Gly Thr Val Phe Lys Glu His Val Lys Asn Phe Tyr
 1 5 10 15
 Leu Ile Gln Arg Leu Ala Gln Phe Gln Val Lys Ile Ile Asn His Ser
 20 25 30
 Asn Tyr Leu Gly Val Ala Trp Glu Leu Ile Asn Pro Val Met Gln Ile
 35 40 45

Met Val Tyr Trp Met Val Phe Gly Leu Gly Ile Arg Ser Asn Ala Pro
 50 55 60
 Ile His Gly Val Pro Phe Val Tyr Trp Leu Leu Val Gly Ile Ser Met
 65 70 75 80
 Trp Phe Phe Ile Asn Gln Gly Ile Leu Glu Gly Thr Lys Ala Ile Thr
 85 90 95
 Gln Lys Phe Asn Gln Val Ser Lys Met Asn Phe Pro Leu Ser Ile Ile
 100 105 110
 Pro Thr Tyr Ile Val Thr Ser Arg Phe Tyr Gly His Leu Gly Leu Leu
 115 120 125
 Leu Leu Val Ile Ile Ala Cys Met Phe Thr Gly Ile Tyr Pro Ser Ile
 130 135 140
 His Ile Ile Gln Leu Leu Ile Tyr Val Pro Phe Cys Phe Phe Leu Thr
 145 150 155 160
 Ala Ser Val Thr Leu Leu Thr Ser Thr Leu Gly Val Leu Val Arg Asp
 165 170 175
 Thr Gln Met Leu Met Gln Ala Ile Leu Arg Ile Leu Phe Tyr Phe Ser
 180 185 190
 Pro Ile Leu Trp Leu Pro Lys Asn His Gly Ile Ser Gly Leu Ile His
 195 200 205
 Glu Met Met Lys Tyr Asn Pro Val Tyr Phe Ile Ala Glu Ser Tyr Arg
 210 215 220
 Ala Ala Ile Leu Tyr His Glu Trp Tyr Phe Met Asp His Trp Lys Leu
 225 230 235 240
 Met Leu Tyr Asn Phe Gly Ile Val Ala Ile Phe Phe Ala Ile Gly Ala
 245 250 255
 Tyr Leu His Met Lys Tyr Arg Asp Gln Phe Ala Asp Phe Leu
 260 265 270

<210> 43
 <211> 995
 <212> DNA
 <213> Staphylococcus aureus

<400> 43
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 gctcattccc aaacataaaa acaaaacatt tttcgttta gatgacatta gtttaaaagc 240

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 atttaaaatg ttatgtatgg gctttaagcg aaaagaaatt aaagcgatga cacctaagat 480
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<210> 44
 <211> 264
 <212> PRT
 <213> Staphylococcus aureus

<400> 44

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Tyr	Arg	Thr	Asn	Lys	Glu	Arg	Met	Lys	Asp	Ala	Leu	Ile	Pro	Lys	His
			20					25					30		
Lys	Asn	Lys	Thr	Phe	Phe	Ala	Leu	Asp	Asp	Ile	Ser	Leu	Lys	Ala	Tyr
			35				40					45			
Glu	Gly	Asp	Val	Ile	Gly	Leu	Val	Gly	Ile	Asn	Gly	Ser	Gly	Lys	Ser
	50					55					60				
Thr	Leu	Ser	Asn	Ile	Ile	Gly	Gly	Ser	Leu	Ser	Pro	Thr	Val	Gly	Lys
65					70				75					80	
Val	Asp	Arg	Asn	Gly	Glu	Val	Ser	Val	Ile	Ala	Ile	Ser	Ala	Gly	Leu
				85					90					95	
Ser	Gly	Gln	Leu	Thr	Gly	Ile	Glu	Asn	Ile	Glu	Phe	Lys	Met	Leu	Cys
			100					105					110		
Met	Gly	Phe	Lys	Arg	Lys	Glu	Ile	Lys	Ala	Met	Thr	Pro	Lys	Ile	Ile
	115						120					125			

Glu Phe Ser Glu Leu Gly Glu Phe Ile Tyr Gln Pro Val Lys Lys Tyr
 130 135 140
 Ser Ser Gly Met Arg Ala Lys Leu Gly Phe Ser Ile Asn Ile Thr Val
 145 150 155 160
 Asn Pro Asp Ile Leu Val Ile Asp Glu Ala Leu Ser Val Gly Asp Gln
 165 170 175
 Thr Phe Ala Gln Lys Cys, Leu Asp Lys Ile Tyr Glu Phe Lys Glu Gln
 180 185 190
 Asn Lys Thr Ile Phe Phe Val Ser His Asn Leu Gly Gln Val Arg Gln
 195 200 205
 Phe Cys Thr Lys Ile Ala Trp Ile Glu Gly Gly Lys Leu Lys Asp Tyr
 210 215 220
 Gly Glu Leu Asp Asp Val Leu Pro Lys Tyr Glu Ala Phe Leu Asn Asp
 225 230 235 240
 Phe Lys Lys Lys Ser Lys Ala Glu Gln Lys Glu Phe Arg Asn Lys Leu
 245 250 255
 Asp Glu Ser Arg Phe Val Ile Lys
 260

<210> 45
 <211> 738
 <212> DNA
 <213> Staphylococcus aureus

<400> 45
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 aaactggaaa aaatctcgtc gtttaggtat ctctttaagc ggtactggtg aagaattaga 180
 aaaacgtcct tacgcaccag gacaacatgg tccaaaccaa cgtaaaaaat tatcagaata 240
 tggtttacaa ttacgtgaaa acaaaaaatt acgttactta tatggaatga ctgaaagaca 300
 attccgtaac acatttgaca tcgctggtaa aaaattcggg gtacacggtg aaaacttcat 360
 gatcttatta gcaagtcgtt tagacgctgt tgtttattca ttaggtttag ctcgactctg 420
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738

<210> 46
<211> 195
<212> PRT
<213> Staphylococcus aureus

<400> 46

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Pro Gly Gln His Gly Pro Asn Gln Arg Lys Lys Leu Ser Glu Tyr Gly
35 40 45
Leu Gln Leu Arg Glu Lys Gln Lys Leu Arg Tyr Leu Tyr Gly Met Thr
50 55 60
Glu Arg Gln Phe Arg Asn Thr Phe Asp Ile Ala Gly Lys Lys Phe Gly
65 70 75 80
Val His Gly Glu Asn Phe Met Ile Leu Leu Ala Ser Arg Leu Asp Ala
85 90 95
Val Val Tyr Ser Leu Gly Leu Ala Arg Thr Arg Arg Gln Ala Arg Gln
100 105 110
Leu Val Asn His Gly His Ile Leu Val Asp Gly Lys Arg Val Asp Ile
115 120 125
Pro Ser Tyr Ser Val Lys Pro Gly Gln Thr Ile Ser Val Arg Glu Lys
130 135 140
Ser Gln Lys Leu Asn Ile Ile Val Glu Ser Val Glu Ile Asn Asn Phe
145 150 155 160
Val Pro Glu Tyr Leu Asn Phe Asp Ala Asp Ser Leu Thr Gly Thr Phe
165 170 175
Val Arg Leu Pro Glu Arg Ser Glu Leu Pro Ala Glu Ile Asn Glu Gln
180 185 190
Leu Ile Arg
195

<210> 47
<211> 980
<212> DNA
<213> Staphylococcus aureus

<400> 47

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 caaaatttaa caataaagaa tactagttag aaatctctta ttaaagggat tgatttgaaa 180
 attttttagtc aacagattaa tgccttgatt ggagagagcg gcgctggaaa aagtttgatt 240
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 tgggtatttta ggcgaaaagt 980

<210> 48
 <211> 258
 <212> PRT
 <213> Staphylococcus aureus
 <400> 48

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 20 25 30
 Ile Asn Ala Leu Ile Gly Glu Ser Gly Ala Gly Lys Ser Leu Ile Ala
 35 40 45
 Lys Ala Leu Leu Glu Tyr Leu Pro Phe Asp Leu Ser Cys Thr Tyr Asp
 50 55 60
 Ser Tyr Gln Phe Asp Gly Glu Asn Val Ser Arg Leu Ser Gln Tyr Tyr
 65 70 75 80
 Gly His Thr Ile Gly Tyr Ile Ser Gln Asn Tyr Ala Glu Ser Phe Asn

tcgtcgcatg caatatttat atgctgacgg rgataatcat gtatttatgg ataatgaaag 360
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 aggtatggaa gtacaaattc aaacatacga aggtgaaact atcgggtgttg aattacctaa 480
 aactgttgaa ttaacagtaa ctgaaacaga acctgggtatt aaagggtgata ctgcaactgg 540
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 cgaagggtgac gttttaatta tcaacactgg tgatggaagc tacatttcaa gaggataatc 660
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<210> 50
 <211> 185
 <212> PRT
 <213> Staphylococcus aureus

<400> 50

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 20 25 30
 Gly Ser Ala Phe Val Arg Ser Lys Leu Arg Asn Leu Arg Thr Gly Ala
 35 40 45
 Ile Gln Glu Lys Thr Phe Arg Ala Gly Glu Lys Val Glu Pro Ala Met
 50 55 60
 Ile Glu Asn Arg Arg Met Gln Tyr Leu Tyr Ala Asp Gly Asp Asn His
 65 70 75 80
 Val Phe Met Asp Asn Glu Ser Phe Glu Gln Thr Glu Leu Ser Ser Asp
 85 90 95
 Tyr Leu Lys Glu Glu Leu Asn Tyr Leu Lys Glu Gly Met Glu Val Gln
 100 105 110
 Ile Gln Thr Tyr Glu Gly Glu Thr Ile Gly Val Glu Leu Pro Lys Thr
 115 120 125
 Val Glu Leu Thr Val Thr Glu Thr Glu Pro Gly Ile Lys Gly Asp Thr
 130 135 140
 Ala Thr Gly Ala Thr Lys Ser Ala Thr Val Glu Thr Gly Tyr Thr Leu
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 Asn Val Pro Leu Phe Val Asn Glu Gly Asp Val Leu Ile Ile Asn Thr
 165 170 175

Gly Asp Gly Ser Tyr Ile Ser Arg Gly
 180 185

<210> 51
 <211> 9326
 <212> DNA
 <213> Staphylococcus aureus

<400> 51
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 ccatggacta ctgagacaag acaagaagcg ccatttatta caatgtgtca tggtgataca 180
 gaacaatatt tgtatacaaa agatttaggc gaagcacatt ttcaagtatg ggaaaagggt 240
 gtcgcaagtt atagtggttg ttgttctgta gagagaattg cacaaggtag atatccttgt 300
 ctttctcaac aagatgtact catgaagtat cagccattga gttataagga aattgaagcg 360
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gcttttattt taggaattat cgtctttatt gttcaatatg aaaagatgga aagggatcgt	7380
aatgaagagt gattcactaa aagaaaatat ttttatcaa gggctatacc aattgattag	7440
aacgatgaca ccactgatta caatacccat tatttcacgt gcatttggtc ccagtgggtg	7500
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cgttcagtta tttttaata gagttatcgc gaagtccgtt aacgacaaac ggcaattgtc	7620
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 <211> 981
 <212> DNA
 <213> Staphylococcus aureus

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cgagaaaata ttaaaagttt ggctgacgat catgtgtttg aattagatat tcgtgaatat	180
gatgcagttg aacaaatcat gaagacatat caatttgatt atgttattca tttagcagca	240
ttagttagtgt ttgctgagtc ggttgagaaa cctatcttat ctcaagaaat aaacgtcgta	300
gcaacattaa gattgttaga aatcattaaa aaatataata atcatataaa acgttttatc	360
tttgcttcgt cagcagctgt ttatgggtgat cttcctgatt tgcctaaaag tgatcaatca	420

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 aattattggt cggtatataa cataccaaca gcggttggtta aatttttttaa tgtatttggg 540
 ccaagacagg atcctaagtc acaatattca ggtgtgattt caaagatggt cgattcattt 600
 gagcataaca agccatttac attttttggt gacggactgc aaactagaga ttttgtatat 660
 gtatatgatg ttgttcaatc tgtacgctta attatggaac acaaagatgc aattggacac 720
 gggtataaca ttggtacagg cacttttact aatttattag aggtttatcg tattattggt 780
 gaattatatg gaaaatcagt cgagcatgaa tttaaagaag cacgaaaagg agatattaag 840
 cattcttatg cagatatttc taacttaaag gcattaggat ttgttcctaa atatacagta 900
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 aaagaagtgg aaatgctgtg a 981

<210> 53
 <211> 326
 <212> PRT
 <213> *Staphylococcus aureus*

<400> 53

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Gly	Ser	His	Leu	Val	Asp	Asp	Leu	Gln	Gln	Asp	Tyr	Asp	Val	Tyr	Val	20	25	30	
Leu	Asp	Asn	Tyr	Arg	Thr	Gly	Lys	Arg	Glu	Asn	Ile	Lys	Ser	Leu	Ala	35	40	45	
Asp	Asp	His	Val	Phe	Glu	Leu	Asp	Ile	Arg	Glu	Tyr	Asp	Ala	Val	Glu	50	55	60	
Gln	Ile	Met	Lys	Thr	Tyr	Gln	Phe	Asp	Tyr	Val	Ile	His	Leu	Ala	Ala	65	70	75	80
Leu	Val	Ser	Val	Ala	Glu	Ser	Val	Glu	Lys	Pro	Ile	Leu	Ser	Gln	Glu	85	90	95	
Ile	Asn	Val	Val	Ala	Thr	Leu	Arg	Leu	Leu	Glu	Ile	Ile	Lys	Lys	Tyr	100	105	110	
Asn	Asn	His	Ile	Lys	Arg	Phe	Ile	Phe	Ala	Ser	Ser	Ala	Ala	Val	Tyr	115	120	125	
Gly	Asp	Leu	Pro	Asp	Leu	Pro	Lys	Ser	Asp	Gln	Ser	Leu	Ile	Leu	Pro	130	135	140	
Leu	Ser	Pro	Tyr	Ala	Ile	Asp	Lys	Tyr	Tyr	Gly	Glu	Arg	Thr	Thr	Leu	145	150	155	160

Asn Tyr Cys Ser Leu Tyr Asn Ile Pro Thr Ala Val Val Lys Phe Phe
 165 170 175
 Asn Val Phe Gly Pro Arg Gln Asp Pro Lys Ser Gln Tyr Ser Gly Val
 180 185 190
 Ile Ser Lys Met Phe Asp Ser Phe Glu His Asn Lys Pro Phe Thr Phe
 195 200 205
 Phe Gly Asp Gly Leu Gln Thr Arg Asp Phe Val Tyr Val Tyr Asp Val
 210 215 220
 Val Gln Ser Val Arg Leu Ile Met Glu His Lys Asp Ala Ile Gly His
 225 230 235 240
 Gly Tyr Asn Ile Gly Thr Gly Thr Phe Thr Asn Leu Leu Glu Val Tyr
 245 250 255
 Arg Ile Ile Gly Glu Leu Tyr Gly Lys Ser Val Glu His Glu Phe Lys
 260 265 270
 Glu Ala Arg Lys Gly Asp Ile Lys His Ser Tyr Ala Asp Ile Ser Asn
 275 280 285
 Leu Lys Ala Leu Gly Phe Val Pro Lys Tyr Thr Val Glu Thr Gly Leu
 290 295 300
 Lys Asp Tyr Phe Asn Phe Glu Val Asp Asn Ile Glu Glu Val Thr Ala
 305 310 315 320
 Lys Glu Val Glu Met Ser
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<210> 54
 <211> 504
 <212> DNA
 <213> Staphylococcus aureus

<400> .54
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 aacgcagaga aaaacggtgc gcaatgggct gataaagatg atgatcgtat aacaaatgtc 180
 gggaagttaa ttcgtaaaac acgcattgat gaattaccac aactaattaa tgttggttaa 240
 ggggaaatga gttttattgg accacgcccg gaacgtccgg aatttgtaga attatttagt 300
 tcagaagtga taggtttcga gcaaagatgt cttgttacac cagggttaac aggacttgcg 360
 caaattcaag gtggatatga cttaacaccg caacaaaaac tgaaatatga catgaaatat 420
 atacataaag gtagtttaat gatggaacta tatatatcaa ttagaacatt gatggttggt 480
 attacagggg aaggctcaag gtag 504

aaacctgatg ttatccattt acattcttcc aaagctggaa cggtcggacg aattgcgaag 180
 ttcatcttga aatcgaaaga cacacgtata gtttttactg cacatggatg ggcttttaca 240
 gaggggtgta aaccagctaa aaaatttcta tttttagtta tcgaaaaatt aatgtcactt 300
 attacagata gcattatttg tgtttcagat ttcgataaac agttagcggt aaaatatcga 360
 tttaatcgat tgaaattaac cacaatacat aatgggtattg cagatgttcc cgctgttaag 420
 caaacgctaa aaagccaatc acataacaat attggcgaag tagttggaat gttgcctaatt 480
 aaacaagatt tacagattaa tgccccgaca aagcatcaat ttgttatgat tgcaagattt 540
 gcttatccaa aattgccaca aaatctaata gcggcaatag agatattgaa attacataac 600
 agtaatcatg cgcattttac atttataggc gatggaccta cattaatatga ttgtcagcaa 660
 caagttgtac aagctgggtt agaaaatgat gtcacatttt tgggcaatgt cattaatgag 720
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 attagcatta tagaagctat ggctacaggt ttgcctgtta tagccagtca tgttggcggt 840
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 gctaaagtcc tggaaaaata tttaatagac agtgattaca tcaaaatgag taatcaatct 960
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<210> 57
 <211> 388
 <212> PRT
 <213> Staphylococcus aureus

<400> 57

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Thr	His	Leu	Ile	Gln	Leu	Ala	Asn	His	Phe	Cys	Val	His	Asn	Asp	Val
			20					25					30		
Tyr	Val	Ile	Val	Gly	Asn	His	Gly	Pro	Met	Ile	Glu	Gln	Leu	Asp	Ala
		35					40					45			
Arg	Val	Asn	Val	Ile	Ile	Ile	Glu	His	Leu	Val	Gly	Pro	Ile	Asp	Phe
	50					55					60				
Lys	Gln	Asp	Ile	Leu	Ala	Val	Lys	Val	Leu	Ala	Gln	Leu	Phe	Ser	Lys
65					70					75				80	
Ile	Lys	Pro	Asp	Val	Ile	His	Leu	His	Ser	Ser	Lys	Ala	Gly	Thr	Val

85										90					95				
Gly	Arg	Ile	Ala	Lys	Phe	Ile	Ser	Lys	Ser	Lys	Asp	Thr	Arg	Ile	Val				
			100						105					110					
Phe	Thr	Ala	His	Gly	Trp	Ala	Phe	Thr	Glu	Gly	Val	Lys	Pro	Ala	Lys				
		115					120					125							
Lys	Phe	Leu	Tyr	Leu	Val	Ile	Glu	Lys	Leu	Met	Ser	Leu	Ile	Thr	Asp				
	130					135					140								
Ser	Ile	Ile	Cys	Val	Ser	Asp	Phe	Asp	Lys	Gln	Leu	Ala	Leu	Lys	Tyr				
145					150					155					160				
Arg	Phe	Asn	Arg	Leu	Lys	Leu	Thr	Thr	Ile	His	Asn	Gly	Ile	Ala	Asp				
				165					170						175				
Val	Pro	Ala	Val	Lys	Gln	Thr	Leu	Lys	Ser	Gln	Ser	His	Asn	Asn	Ile				
			180					185					190						
Gly	Glu	Val	Val	Gly	Met	Leu	Pro	Asn	Lys	Gln	Asp	Leu	Gln	Ile	Asn				
		195					200					205							
Ala	Pro	Thr	Lys	His	Gln	Phe	Val	Met	Ile	Ala	Arg	Phe	Ala	Tyr	Pro				
	210					215					220								
Lys	Leu	Pro	Gln	Asn	Leu	Ile	Ala	Ala	Ile	Glu	Ile	Leu	Lys	Leu	His				
225					230					235					240				
Asn	Ser	Asn	His	Ala	His	Phe	Thr	Phe	Ile	Gly	Asp	Gly	Pro	Thr	Leu				
			245						250					255					
Asn	Asp	Cys	Gln	Gln	Gln	Val	Val	Gln	Ala	Gly	Leu	Glu	Asn	Asp	Val				
		260						265					270						
Thr	Phe	Leu	Gly	Asn	Val	Ile	Asn	Ala	Ser	His	Leu	Leu	Ser	Gln	Tyr				
		275					280						285						
Asp	Thr	Phe	Ile	Leu	Ile	Ser	Lys	His	Glu	Gly	Leu	Pro	Ile	Ser	Ile				
	290					295					300								
Ile	Glu	Ala	Met	Ala	Thr	Gly	Leu	Pro	Val	Ile	Ala	Ser	His	Val	Gly				
305					310					315					320				
Gly	Ile	Ser	Glu	Leu	Val	Ala	Asp	Asn	Gly	Ile	Cys	Met	Met	Asn	Asn				
			325						330					335					
Gln	Pro	Glu	Thr	Ile	Ala	Lys	Val	Leu	Glu	Lys	Tyr	Leu	Ile	Asp	Ser				
			340					345					350						
Asp	Tyr	Ile	Lys	Met	Ser	Asn	Gln	Ser	Arg	Lys	Arg	Tyr	Leu	Glu	Cys				
	355						360					365							
Phe	Thr	Glu	Glu	Lys	Met	Ile	Lys	Glu	Val	Glu	Asp	Val	Tyr	Asn	Gly				
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Lys	Ser	Thr	Gln																

385

<210> 58
<211> 1239
<212> DNA
<213> Staphylococcus aureus

<400> 58
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ctaataattag tttattttact gtttttcgct aaccattttat taaaggcaaa tcattttttta 180
cagttttttca ttatttttgta tacatatcgt atgattatta cgctttggtt gctattttttt 240
gatgatttga tattttattac ggttaaggaa gttcttgcat ctacagttaa atatgcattt 300
gtagtcattt atttctattt agggatgatc atctttaagt taggtaatag caaaaaagtg 360
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ttaatgaatg accctaacta tttcgcgatg acacagatta ttacattggg acttgcttac 540
aagtatatcc ataattacat attcaaggtc cttgcatgtg gtattttgct atgggtcttta 600
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attaaaaagt tatttagtag aaatgcggta agtggtgtga gtatgtcagt gattatgctg 720
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<210> 59
<211> 412
<212> PRT
<213> Staphylococcus aureus

<400> 59

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Leu	Ala	Val	Phe	Ile	Gln	Gln	Ser	Ser	Val	Ile	Ala	Gly	Val	Asn	Val	20	25	30	
Ser	Ile	Ala	Asp	Phe	Ile	Thr	Leu	Leu	Ile	Leu	Val	Tyr	Leu	Leu	Phe	35	40	45	
Phe	Ala	Asn	His	Leu	Leu	Lys	Ala	Asn	His	Phe	Leu	Gln	Phe	Phe	Ile	50	55	60	
Ile	Leu	Tyr	Thr	Tyr	Arg	Met	Ile	Ile	Thr	Leu	Cys	Leu	Leu	Phe	Phe	65	70	75	80
Asp	Asp	Leu	Ile	Phe	Ile	Thr	Val	Lys	Glu	Val	Leu	Ala	Ser	Thr	Val	85	90	95	
Lys	Tyr	Ala	Phe	Val	Val	Ile	Tyr	Phe	Tyr	Leu	Gly	Met	Ile	Ile	Phe	100	105	110	
Lys	Leu	Gly	Asn	Ser	Lys	Lys	Val	Ile	Val	Thr	Ser	Tyr	Ile	Ile	Ser	115	120	125	
Ser	Val	Thr	Ile	Gly	Leu	Phe	Cys	Ile	Ile	Ala	Gly	Leu	Asn	Lys	Ser	130	135	140	
Pro	Leu	Leu	Met	Lys	Leu	Leu	Tyr	Phe	Asp	Glu	Ile	Arg	Ser	Lys	Gly	145	150	155	160
Leu	Met	Asn	Asp	Pro	Asn	Tyr	Phe	Ala	Met	Thr	Gln	Ile	Ile	Thr	Leu	165	170	175	
Val	Leu	Ala	Tyr	Lys	Tyr	Ile	His	Asn	Tyr	Ile	Phe	Lys	Val	Leu	Ala	180	185	190	
Cys	Gly	Ile	Leu	Leu	Trp	Ser	Leu	Thr	Thr	Thr	Gly	Ser	Lys	Thr	Ala	195	200	205	
Phe	Ile	Ile	Leu	Ile	Val	Leu	Ala	Ile	Tyr	Phe	Phe	Ile	Lys	Lys	Leu	210	215	220	
Phe	Ser	Arg	Asn	Ala	Val	Ser	Val	Val	Ser	Met	Ser	Val	Ile	Met	Leu	225	230	235	240
Ile	Leu	Leu	Cys	Phe	Thr	Phe	Tyr	Asn	Ile	Asn	Tyr	Tyr	Leu	Phe	Gln	245	250	255	
Leu	Ser	Asp	Leu	Asp	Ala	Leu	Pro	Ser	Leu	Asp	Arg	Met	Ala	Ser	Ile	260	265	270	
Phe	Glu	Glu	Gly	Phe	Ala	Ser	Leu	Asn	Asp	Ser	Gly	Ser	Glu	Arg	Ser	275	280	285	
Val	Val	Trp	Ile	Asn	Ala	Ile	Ser	Val	Ile	Lys	Tyr	Thr	Leu	Gly	Phe	290	295	300	

Gly Val Gly Leu Val Asp Tyr Val His Ile Gly Ser Gln Ile Asn Gly
 305 310 315 320
 Ile Leu Leu Val Ala His Asn Thr Tyr Leu Gln Ile Phe Ala Glu Trp
 325 330 335
 Gly Ile Leu Phe Gly Ala Leu Phe Ile Ile Phe Met Leu Tyr Leu Leu
 340 345 350
 Phe Glu Leu Phe Arg Phe Asn Ile Ser Gly Lys Asn Val Thr Ala Ile
 355 360 365
 Val Val Met Leu Thr Met Leu Ile Tyr Phe Leu Thr Val Ser Phe Asn
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 Asn Ser Arg Tyr Val Ala Phe Ile Leu Gly Ile Ile Val Phe Ile Val
 385 390 395 400
 Gln Tyr Glu Lys Met Glu Arg Asp Arg Asn Glu Glu
 405 410

<210> 60
 <211> 1455
 <212> DNA
 <213> Staphylococcus aureus

<400> 60
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<210> 61
 <211> 476
 <212> PRT
 <213> Staphylococcus aureus

<400> 61

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 Gln Leu Ile Arg Thr Met Thr Pro Leu Ile Thr Ile Pro Ile Ile Ser
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 Arg Ala Phe Gly Pro Ser Gly Val Gly Ile Val Ser Phe Ser Phe Asn
 35 40 45
 Ile Val Gln Tyr Phe Leu Met Ile Ala Ser Val Gly Val Gln Leu Tyr
 50 55 60
 Phe Asn Arg Val Ile Ala Lys Ser Val Asn Asp Lys Arg Gln Leu Ser
 65 70 75 80
 Gln Gln Phe Trp Asp Ile Phe Val Ser Lys Leu Phe Leu Ala Leu Thr
 85 90 95
 Val Phe Ala Met Tyr Met Val Val Ile Thr Ile Phe Ile Asp Asp Tyr
 100 105 110
 Tyr Leu Ile Phe Leu Leu Gln Gly Ile Tyr Ile Ile Gly Ala Ala Leu
 115 120 125
 Asp Ile Ser Trp Phe Tyr Ala Gly Thr Glu Lys Phe Lys Ile Pro Ser
 130 135 140
 Leu Ser Asn Ile Val Ala Ser Gly Ile Val Leu Ser Val Val Val Ile

145		150		155		160
Phe Val Lys Asp	Gln Ser Asp Leu Ser	Leu Tyr Val Phe Thr	Ile Ala			
	165	170	175			
Ile Val Thr Val	Leu Asn Gln Leu Pro	Leu Phe Ile Tyr	Leu Lys Arg			
	180	185	190			
Tyr Ile Ser Phe	Val Ser Val Asn Trp	Ile His Val Trp	Gln Leu Phe			
	195	200	205			
Arg Ser Ser Leu	Ala Tyr Leu Leu Pro	Asn Gly Gln Leu	Asn Leu Tyr			
	210	215	220			
Thr Ser Ile Ser	Cys Val Val Leu Gly	Leu Val Gly Thr	Tyr Gln Gln			
	225	230	235	240		
Val Gly Ile Phe	Ser Asn Ala Phe Asn	Ile Leu Thr Val	Ala Ile Ile			
	245	250	255			
Met Ile Asn Thr	Phe Asp Leu Val Met	Ile Pro Arg Ile	Thr Lys Met			
	260	265	270			
Ser Ile Gln Gln	Ser His Ser Leu Thr	Lys Thr Leu Ala	Asn Asn Met			
	275	280	285			
Asn Ile Gln Leu	Ile Leu Thr Ile Pro	Met Val Phe Gly	Leu Ile Ala			
	290	295	300			
Ile Met Pro Ser	Phe Tyr Leu Trp Phe	Phe Gly Glu Glu	Phe Ala Ser			
	305	310	315	320		
Thr Val Pro Leu	Met Thr Ile Leu Ala	Ile Leu Val Leu	Ile Ile Pro			
	325	330	335			
Leu Asn Met Leu	Ile Ser Arg Gln Tyr	Leu Leu Ile Val	Asn Lys Ile			
	340	345	350			
Arg Leu Tyr Asn	Ala Ser Ile Thr Ile	Gly Ala Val Ile	Asn Leu Val			
	355	360	365			
Leu Cys Ile Ile	Leu Ile Tyr Phe Tyr	Gly Ile Tyr Gly	Ala Ala Ile			
	370	375	380			
Ala Arg Leu Ile	Thr Glu Phe Phe Leu	Leu Ile Trp Arg	Phe Ile Asp			
	385	390	395	400		
Ile Thr Lys Ile	Asn Val Lys Leu Asn	Ile Val Ser Thr	Ile Gln Cys			
	405	410	415			
Val Ile Ala Ala	Val Met Met Phe Ile	Val Leu Gly Val	Val Asn His			
	420	425	430			
Tyr Leu Pro Pro	Thr Met Tyr Ala Thr	Leu Leu Leu Ile	Ala Ile Gly			
	435	440	445			
Ile Val Val Tyr	Leu Leu Leu Met Met	Thr Met Lys Asn	Gln Tyr Val			

450

455

460

Trp Gln Ile Leu Arg His Leu Arg His Lys Thr Ile
465 470 475